TI-83

EASY WARM UPS

ALGEBRA ONE

Finding a Rational Number Between Two Rationals • Evaluating a Number to a Power
• Radicals • Percent • Mean and Median • Box-and-Whisker Plots
• Probability • Evaluating Algebraic Expressions • Evaluating Functions
• Plotting Points on a Coordinate Plane • Graphing Linear Equations
• Graphing Direct and Inverse Variations • Solving Equations by Graphing
• Slope • Scatter Plots • Best-fitting Lines • Operations on Functions
• Composition of Functions • Solving Inequalities • Shading Inequalities
• Using Formulas • Systems of Equations • Graphing Systems of Inequalities
• Looking For A Pattern • Scientific Notation • Graphing Quadratic Equations
• Solving Quadratic Equations by Graphing • Graphing Exponential Functions
• Graphing Rational Functions • Graphing Radical Functions
• Absolute Value Inequalities

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Warm Up 1:
Finding a Rational Number Between Two Rationals

Objective: To find a rational number between two rationals using the TI-83.

1. Press **ON 2nd QUIT** to view the computation or home screen. This screen is blank. Press **CLEAR** to clear the screen. Enter the first rational number into the graphing calculator to find its decimal equivalent. Enter the second rational number into the graphing calculator to find its decimal equivalent. Determine a decimal number between the two decimals.

```
23/34
        .6764705882
31/42
        .7380952381
```

2. Find the decimal number between 23/34 and 31/42 by pressing **2 3 ÷ 3 4 ENTER 3 1 ÷ 4 2 ENTER** . The decimal approximation for 23/34 is .6765 and for 31/42 is .7381. Any decimal number between these is appropriate. Choose .7200.

3. Enter this decimal into the graphing calculator and convert it by pressing **. 7 2 MATH 1 ENTER** .

```
23/34
        .6764705882
31/42
        .7380952381
.72▶Frac
              18/25
```

4. If you enter the expression incorrectly, you can re-enter the expression or press **2nd ENTRY** to recall the expression. Use the arrow keys to move the cursor within the expression. Correct errors by pressing **DEL** to delete the mistake, pressing **2nd INS** to insert missing items, or simply type over the mistake with the correct item.
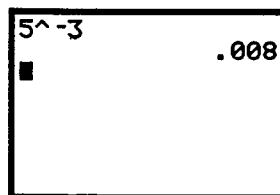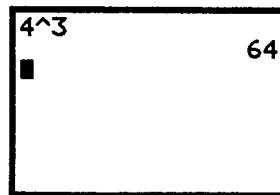
Practice 1:

Find the rational number between the two rationals using your calculator.

1. 3/7 and 2/3   = _____

2. 3/11 and 6/23   = _____

3. 14/15 and 6/7   = _____

4. 7/13 and 1/2   = _____

5. 16/19 and 12/17   = _____

6. 4/5 and 9/14   = _____

Warm Up 2:
Evaluating a Number to a Power

Objective: To evaluate a number to a power using the TI-83.

1. Press **ON 2nd QUIT** to view the home screen. Press **CLEAR** to clear the screen.

2. Use the TI-83 to evaluate a number to a power. For example, to calculate 4^3, simply press **4 ^ 3 ENTER**.

3. When working with negative powers you will need to use the (-) key to attach the negative sign. You may also need parentheses to insure items are being calculated in the manner you desire. For example, to calculate 5^{-3} you would press **5 ^ (-) 3 ENTER**. But to calculate $(-5)^3$ you would need to use parentheses.

```
4^3
            64
■
```

```
5^-3
            .008
■
```

Practice 2:

Evaluate.

1. 2^{-4} = _____

2. 6^0 = _____

3. $(-5)^3$ = _____

4. 3^{-2} = _____

5. 3^5 = _____

6. $(-1.2)^4$ = _____

Compare. Use >, < or =.

7. 3^3 _____ 5^2

8. 10^3 _____ $(-10)^3$

9. 10^2 _____ 2^{10}

10. 3^4 _____ 4^2

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Warm Up 3:
Radicals

Objective: To calculate a radical using the TI-83.

1. Press **ON 2nd QUIT** to view the home screen. Press **CLEAR** to clear the screen.

2. Calculate the radical of a number on the graphing calculator. For example, to find the $\sqrt{15}$ simply press **2nd √ 1 5 ENTER**. Notice the square root of 15 is approximately 3.87.

```
√15
        3.872983346
```

3. Find the squre root of a fraction. For example, to find the square root of 5/12, press **2nd √ (5 ÷ 1 2) ENTER**. Notice the 5/12 is in parentheses. This forces the calcuator to take the square root of the whole fraction and not just the numerator. The square root of 5/12 is approximately .65.

```
√(5/12)
        .6454972244
■
```

Practice 3:
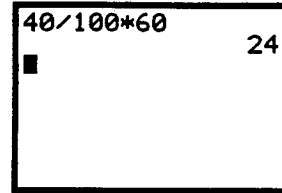
Find each square root.

1. $\sqrt{7}$ = _____

2. $\sqrt{15} \div \sqrt{6}$ = _____

3. $-\sqrt{18}$ = _____

4. $\sqrt{5} \times \sqrt{11}$ = _____

5. $\sqrt{26} - \sqrt{17}$ = _____

6. $\sqrt{(6/13)}$ = _____

7. $-\sqrt{14} + \sqrt{8}$ = _____
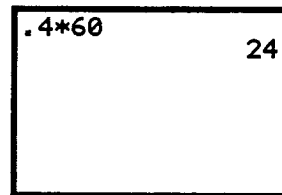
8. $\sqrt{(14/15)}$ = _____

Warm Up 4:
Percent

Objective: To find the percent of a number using the TI-83.

1. Press **ON 2nd QUIT** to view the home screen. Press **CLEAR** to clear the screen.

2. You can easily find the percent of a number on the graphing calculator. For example, to find 40% of 60 by pressing **4 0 ÷ 1 0 0 × 6 0 ENTER**. Notice that 40% of 60 is 24.

```
40/100*60
              24
■
```

3. Another way to find 40% of 60 is to convert the 40% to a decimal and then multiply. The decimal equivalent for 40% is .4. Find 40% of 60 by pressing **. 4 × 6 0 ENTER**.

```
.4*60
              24
```
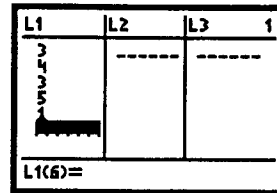
Practice 4:

Find the percent of a number.

1. 25% of 80   = _____

2. 30% of 30   = _____

3. 60% of 120   = _____

4. 16% of 12.5   = _____

5. 80% of 25   = _____

6. 75% of 48   = _____

Warm Up 5:
Mean and Median

Objective: To calculate the mean and median of a data
set using the TI-83.

1. Enter the data set into the calculator by first pressing
   STAT **1** (Edit), and pressing **DEL** repeatedly to
   delete data from the first list (L_1). If necessary, press ▶
   to move to the second list. Enter the data set {3, 4, 3, 5,
   1} into L_1 by pressing **3** **ENTER** **4** **ENTER** **3**
   ENTER **5** **ENTER** **1** **ENTER**.

```
L1    L2    L3     1
3
4
3
5
1
------------------
L1(6)=
```

2. Calculate the mean and median of the data set
   by pressing **STAT** ▶ **1** (1-Var Stats) **ENTER**.
   Notice the mean (x̄) is 3.2. Press ▼ several times until
   you see the median is 3.

```
1-Var Stats
x̄=3.2
Σx=16
Σx²=60
Sx=1.483239697
σx=1.326649916
↓n=5
```
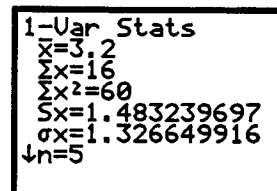
Practice 5:

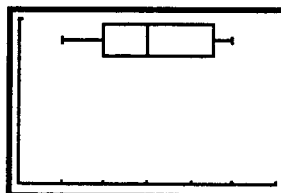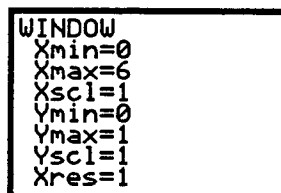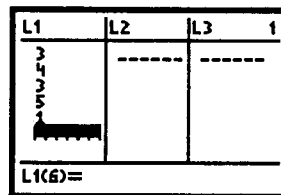Use your graphing calculator to find the mean and median
for each data set.

1. {1, 3, 1, 2, 4, 2, 1, 4}

   mean _____

   median _____

2. {12, 3, 3, 14, 4, 5, 4, 13, 2, 11}

   mean _____

   median _____

3. {8, 5, 8, 4, 9, 5, 3, 4, 3, 3, 2}

   mean _____

   median _____

4. {15, 14, 13, 11, 14, 15, 15}

   mean _____

   median _____

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Warm Up 6:
Box-and-Whisker Plots

Objective: To draw box-and-whisker plots using the TI-83.

1. Press **Y=** and **CLEAR** to clear the Y_1 prompt. Press
   ▼ and **CLEAR** to clear additional prompts.

2. Enter the data set into the calculator by first pressing
   STAT 1 (Edit), and pressing **DEL** repeatedly to
   delete data from the first list (L_1). If necessary, press ▶
   to move to the second list. Enter the data set {3, 4, 3, 5,
   1} into L_1 by pressing **3 ENTER 4 ENTER 3
   ENTER 5 ENTER 1 ENTER**.

3. Set the viewing window by pressing **WINDOW 0
   ENTER 6 ENTER 1 ENTER 0 ENTER 1
   ENTER 1 ENTER**. The Xmin, Xmax and Xscl
   were set to see all of the box-and-whisker plot. The
   Ymin, Ymax and Ymin will not change.

4. Set up the box-and-whisker plot by pressing **2nd
   STATPLOT 1 ENTER ▼ ▶ ▶ ▶ ENTER ▼
   2nd L1 ENTER ALPHA 1 ENTER**. View the
   box-and-whisker plot by pressing **GRAPH**.
   Remember to turn off the statistics plot by pressing **2nd
   STATPLOT 1 ▶ ENTER CLEAR**.

Practice 6:

Use your graphing calculator to draw box-and-whisker plot.
Sketch your results in the space below each set.

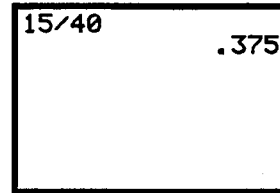1. {1, 3, 1, 2, 4, 2, 1, 4}

2. {2, 3, 3, 4, 4, 5, 4, 3, 2, 1}
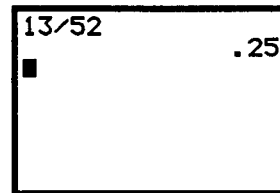
3. {1, 2, 3, 4, 4, 3, 3, 2}

4. {5, 4, 3, 1, 4, 5, 5}

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Warm Up 7:
Probability

Objective: To calculate probability using the TI-83.

1. Press **ON 2nd QUIT** to view the home screen. Press **CLEAR** to clear the screen.

```
15/40
          .375
```

2. Calculate the probability of an event using the graphing calculator. The method for finding the probability of an event is to divide the number of possibilities in the event by the total number of possibilities. For example, 15 girls are in a class of 40 students, find the probability of a answering a question by pressing **1 5 ÷ 4 0 ENTER** . The probability of a girl answering a question is .375.

```
13/52
          .25
■
```

3. Find the probability of drawing a heart from a standard set of shuffled cards. There are 13 heart cards in a standard set of cards. There are 52 cards in the whole deck. Find the probability of drawing a heart by pressing **1 3 ÷ 5 2 ENTER** . The probability of drawing a heart from a standard set of shuffled cards is .25.

Practice 7:

Calculate the probabilities.

1. Drawing a Jack of Clubs from a standard set of shuffled cards.

    _____

2. Picking a perfect square from the integers 1 through 30.

    _____

3. Drawing a number less than 5 from a deck of shuffled cards (no Aces).

    _____

4. Getting an 8 when rolling a single die.

    _____

5. Picking a multiple of 7 from the integers 1 through 30.

    _____

6. Getting a 5 or 2 when rolling a single die.

    _____

Warm Up 8:
Evaluating Algebraic Expressions

Objective: To evaluate algebraic expressions using the TI-83.

1. Press **ON 2nd QUIT** to view the home screen. Press
    CLEAR to clear the screen.

2. Evaluate $2x^2/(x + y)$ for x = 2 and y = 4. First, store the
    initial values for x and y by pressing **2 STO▶ X,T,θ ,n
    ENTER 4 STO▶ ALPHA Y ENTER** . Second,
    enter the expression by pressing **2 X,T,θ,n x² ÷ (
    X,T,θ ,n + ALPHA Y)** . Evaluate the expression by
    pressing **ENTER** .

3. Re-evaluate the expression for x = 3 and y = 5 by storing
    the new values and recalling the expression. Store the new
    values by pressing pressing **3 STO▶ X,T,θ,n
    ENTER 5 STO▶ ALPHA Y ENTER** . Recall the
    expression by pressing **2nd ENTRY** three times.
    Press **ENTER** to re-evaluate the expression for the new
    values.

```
2→X
                    2
4→Y
                    4
2X²⁄(X+Y)
          1.333333333
```

```
3→X
                    3
5→Y
                    5
2X²⁄(X+Y)
                 2.25
■
```

Practice 8:

Evaluate the expressions.

1. $(x + y)/y^2$ for x = 15 and y = 8   _____

    for x = 6 and y = 14   _____

2. $x^2 - x + y^2$ for x = 9 and y = 11   _____

    for x = 16 and y = 5   _____

3. $(x - y^3)•(y^2 - x^2)$ for x = 10 and y = 7   _____

    for x = 4 and y = 17   _____

4. $(x^3 + y^3)/(x^2 - y^2)$ for x = 13 and y = 12   _____

    for x = 18 and y = 3   _____

Warm Up 9:
Evaluating Functions

Objective: To evaluate functions using the TI-83.

1. Press **ON** **2nd** **QUIT** to view the home screen. Press **CLEAR** to clear the screen.

2. Evaluate the function $f(x) = x^2 + 5$ for $x = 18$ by first entering the function for Y_1. Do this by pressing **Y=** **X,T,θ,n** x^2 **+** **5** **ENTER**.

3. Evaluate the function for 18 by pressing **2nd** **QUIT** **CLEAR** **VARS** ▶ **1** **1** **(** **1** **8** **)** **ENTER**.

4. Evaluate the function for 20 by pressing **2nd** **ENTRY** ◀ ◀ ◀ **2** **0** **ENTER**.

```
Plot1  Plot2  Plot3
\Y1◻X²+5
\Y2=
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

```
Y1(18)
                329
Y1(20)
                405
```

Practice 9:

Evaluate the functions.

1. $f(x) = x + 173$ for $x = 247$ _____

    for $x = 165$ _____

2. $f(x) = x^3 - x^2$ for $x = 23$ _____

    for $x = 35$ _____

3. $f(x) = \sqrt{x} + x$ for $x = 43$ _____

    for $x = 27$ _____

4. $f(x) = x^4 - 2x^3 + 3x^2$ for $x = 9$ _____

    for $x = 17$ _____

Warm Up 10:
Plotting Points on a Coordinate Plane

Objective: To plot points on a coordinate plane using the TI-83.

1. Press **Y= CLEAR** to clear Y_1. Press **▼ CLEAR** to clear additional y prompts.

2. Press **ZOOM 4** to view the coordinate plane. Plot points on the coordinate plane by pressing **2nd DRAW ▶ 1** . Press the arrow keys to move the cursor to the location where the point is to be plotted. Watch the coordinates displayed on the bottom of the screen. Press **ENTER** to plot the point.

3. Plot additional points by moving the cursor to the next location and pressing **ENTER** .

4. Plot the points (1, 1), (-2, 2), and (3, -1).
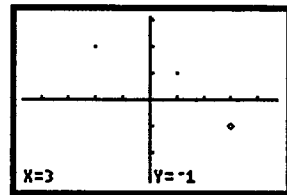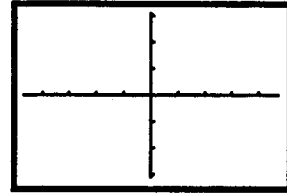
Practice 10:

Plot the points on a coordinate plane. Sketch what you see in the space provided.

1. (2, 1), (-3, 1), and (2, -1).   2.   (-1, 3), (-2, -2), and (3, 3).

3. (3, 2), (-4, -3), and (-3, 1).   4.   (4, 2), (3, -2), and (1, -1).

Warm Up 11:
Graphing Linear Equations

Objective: To graph linear equations using the TI-83.

1. Press **Y=** and **CLEAR** to clear the Y_1 prompt. Press
   ▼ and **CLEAR**   to clear additional prompts.

```
Plot1 Plot2 Plot3
\Y1■X+1
\Y2=
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

2. To graph equations, for example, the equation $y = x + 1$,
   enter the equation $y = x + 1$ for Y_1 by moving the
   blinking cursor to the Y_1 prompt and pressing **X,T,θ,n**
+
   1 ENTER .

3. Set the viewing window to a standard viewing window and
   view the graph of the equation by pressing **ZOOM 6**
   (ZStandard). This graph is made up of many points.
   Press **TRACE** to place a tracer on the graph. Move the
   tracer by pressing the left or right arrow keys. You will
   see the ordered pair at the bottom of the screen for the
   point at which the tracer is located.

```
WINDOW
 Xmin=-10
 Xmax=10
 Xscl=1
 Ymin=-10
 Ymax=10
 Yscl=1
 Xres=1
```

4. Press **WINDOW** to view the Xmin, Xmax, Xscl,
   Ymin, Ymax and Yscl for a standard viewing window.
   Notice the standard viewing window runs from -10 to 10
   along each coordinate axis with "tick marks" one unit
   apart.

Practice 11:

Graph each linear equation in the standard viewing window. Sketch what you
see in the space below each equation.

1. $y = -x + 3$

4. $y = -x - 2$

3. $y = x - 4$

2. $y = x + 5$

Warm Up 12:
Graphing Direct and Inverse Variations

Objective: To graph direct and inverse variations using the TI-83.

1. Press **Y=** and **CLEAR** to clear the Y_1 prompt. Press ▼ and **CLEAR** to clear additional prompts.

```
Plot1  Plot2  Plot3
\Y1■3X
\Y2=■
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

2. To graph the direct variation y = k x, first find k and then enter the equation for Y_1. Enter y = 3x by moving the blinking cursor to the Y_1 prompt and pressing **3 X,T,θ ,n ENTER** .

3. Set the viewing window to the decimal viewing window and view the graph of the equation by pressing **ZOOM 4** (ZDecimal).

4. Graph inverse variations y = k / x in the same manner. First find k and then enter the equation for Y_1.
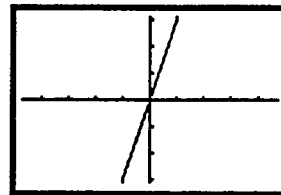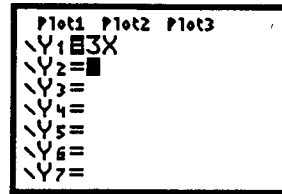
Practice 12:

Graph the direct or inverse variation.
Sketch what you see in the space provided.

1. direct variation with k = -2

2. inverse variation with k = 3

3. direct variation with k = 5

4. inverse variation with k = -4

Warm Up 13:
Solving Equations by Graphing

Objective: To solve an equation by graphing using the TI-83.

1. Press **Y=** and **CLEAR** to clear the Y_1 prompt. Press ▼ and **CLEAR** to clear additional prompts.

2. Set the equation equal to zero. Enter your equation for Y_1. For example, enter $3x - 2 = 0$ for Y_1 by pressing **3 X,T,θ,n − 2 ENTER**. Press **ZOOM 4** to view the equation in the decimal window.

3. Find where the equation is equal to zero by pressing **2nd CALC 2** (zero), set the left bound for the calculation by moving the cursor to the left (below in this case) of the zero by pressing ▶ and then press **ENTER**. Set the upper bound for the calculation by pressing ▶ to move the cursor to the right (above in this case) of the zero and press **ENTER ENTER**. An accurate approximate for the zero will appear at the bottom of the screen.
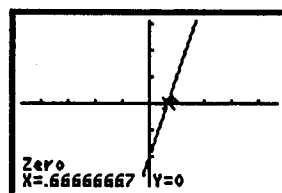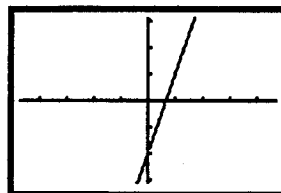
Practice 13:

Find the solution to the equation. Sketch what you see in the space provided.

1. $7x + 2 = 0$

2. $-6x + 3 = 0$

3. $5x - 4 = 0$

4. $-4x + 5 = 0$

5. $3x + 6 = 4$

6. $-2x + 7 = 4$

Warm Up 14:
Slope

Objective: To find the slope using the TI-83

1. Press **ON 2nd QUIT** to view the home screen. Press **CLEAR** to clear the screen.

2. Use the TI-83 to find the slope of the line passing through two points. Given the points (-1, 5) and (2,3) find the slope by pressing **(3 – 5) ÷ (2 – (-) 1) ENTER** . Notice that the difference of the y and x coordinates are enclosed by parentheses

3. Repeat calculations for other slopes by pressing **2nd ENTRY** and editing the expressiong for the new coordinates. Try the points (3, 1) and (1, -2).

```
(3-5)/(2--1)
         -.6666666667
■
```

```
(3-5)/(2--1)
         -.6666666667
(-2-1)/(1-3)
                  1.5
```

Practice 14:

Find the slope of the line passing through the two points.

1. (-10, 4) and (8, 9)
_____

2. (12, 5) and (8, -3)
_____

3. (13, -15) and (4, 6)
_____

4. (-11, 4) and (-2,3)
_____

5. (-15, -5) and (12,13)
_____

6. (14, 9) and (-16,-8)
_____

Warm Up 15:
Scatter Plots

Objective: To graph a scatter plot of data points using the TI-83.

1. Press **Y=** and **CLEAR** to clear the Y_1 prompt. Press
   ▼ and **CLEAR** to clear additional prompts. Enter the
   data points in a statistics data set by pressing **STAT 1**.
   If a data set is present in L_1, press **STAT 4 2nd L1**
   ENTER to clear the data set. Repeat for other lists.

2. Re-access the data entry screen by pressing **STAT 1**.
   Enter the data points (1,2), (4,3), (6,5) by placing the x
   coordinate in List 1 and the y coordinate in List 2. Do
   this by pressing **1 ENTER 4 ENTER 6 ENTER**
   ▶ 2 ENTER 3 ENTER 5 ENTER.

3. View the scatter plot in the standard viewing window by
   pressing **ZOOM 6 2nd STAT PLOT 1 ENTER**
   ▼ ENTER GRAPH. Press **2nd STAT PLOT 1 ▶**
   ENTER to turn the scatter plot off.
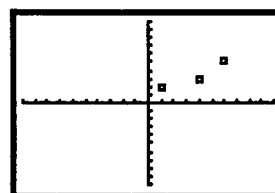
Practice 15:

Graph the scatter plots. Sketch what you see in the space
provided

1. (-1,3), (3,4), (5,-6)

2. (1,5), (2,4), (3,5)
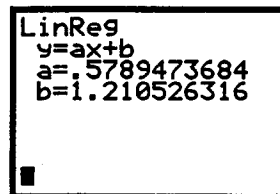
3. (1,-2), (2,-3), (4,-5)

4. (-2,-2), (4,-3), (-7,5)

Warm Up 16:
Best-Fitting Lines

Objective: Find the best-fitting line for a set of data points using the TI-83.

1. Press **Y=** and **CLEAR** to clear the Y_1 prompt. Press **▼** and **CLEAR** to clear additional prompts. Enter the data points in a statistics data set as shown in Warm Up 15. Enter the data points (1,2), (4,3), and (6,5).

```
LinReg
y=ax+b
 a=.5789473684
 b=1.210526316

■
```

2. Calculate the best-fitting line for the data points by pressing **STAT ▶ 4 ENTER**. Notice that the line y = ax + b is displayed. Enter the equation for Y_1 by pressing **Y= VARS 5 ▶ ▶ 1**.

3. Turn on the scatter plot as shown in Warm Up 15 and view the points and the best-fitting line by pressing **ZOOM 6**.
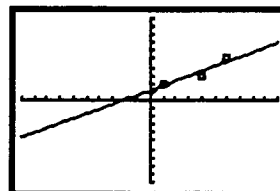
Practice 16:

Find and graph the best-fitting lines. Sketch what you see in the space provided.

1. (-1,2), (3,4), (5,6)

2. (1,5), (2,4), (3,2)

3. (1,-2), (2,1), (4,3)

4. (-2,-2), (-1,1), (2,5)

Warm Up 17:
Operations on Functions

Objective: To perform operations on functions using the TI-83.

1. Press **Y=** and **CLEAR** to clear the Y_1 prompt. Press
   ▼ and **CLEAR** to clear additional prompts. Enter the
   functions for Y_1 and Y_2. For example, enter f(x) =
   2x + 1 for Y_1 and g(x) =√x for Y_2 by moving the cursor
   to Y_1 and pressing **2** **X,T,θ,n** **+** **1** **ENTER** **2nd** **√**
   X,T,θ,n **)** **ENTER** .

```
Plot1  Plot2  Plot3
\Y1⊟2X+1
\Y2⊟√(X)
\Y3=∎
\Y4=
\Y5=
\Y6=
\Y7=
```
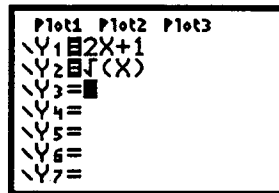
2. Press **2nd** **QUIT** **CLEAR** to return to and clear the
   "home screen." To evaluate (f + g)(4), first store 4 into the
   X variable by pressing **4** **STO▶** **X,T,θ,n** **ENTER** .
   Evaluate (f + g)(4) by pressing **VARS** **▶** **1** **1** **+**
   VARS **▶** **1** **2** **ENTER** .

```
4→X
              4
Y1+Y2
             11
∎
```
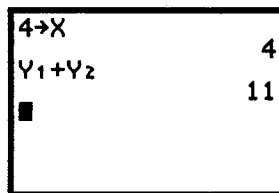
3. Recall the expression by pressing **2nd** **ENTRY** . Edit
   the expression to calculate (f - g)(4), (fg)(4), and
   (f / g)(4).

Practice 17:
Find the operations on functions.

1. Given f(x) = 3x and g(x) =√(x + 1).

   (f + g)(3) = _____

   (f - g)(3) = _____

   (fg)(3) = _____

   (f / g)(3) = _____

2. Given f(x) = -2x − 1 and g(x) = 3x − 2.

   (f + g)(2) = _____

   (f - g)(2) = _____

   (fg)(2) = _____

   (f / g)(2) = _____

3. Given f(x) = √x − 2 and g(x) =4x + √(5x).

   (f + g)(5) = _____

   (f - g)(5) = _____

   (fg)(5) = _____

   (f / g)(5) = _____

Warm Up 18:
Composition of Functions

Objective: To find the composition of functions using the TI-83.

1. Press **Y=** and **CLEAR** to clear the Y_1 prompt. Press ▼ and **CLEAR** to clear additional prompts. Enter the functions for Y_1 and Y_2. For example, enter f(x) = 2x + 1 for Y_1 and g(x) =√x for Y_2 by moving the cursor to Y_1 and pressing **2 X,T,θ,n + 1 ENTER 2nd √ X,T,θ,n) ENTER** .

```
Plot1 Plot2 Plot3
\Y1=2X+1
\Y2=√(X)
\Y3=Y1(Y2)
\Y4=
\Y5=
\Y6=
\Y7=
```

2. Enter the composition of Y_2 into Y_1 for Y_3 by pressing **VARS ▶ 1 1 (VARS ▶ 1 2) ENTER** . Keep Y_1 and Y_2 graphs from appearing by deselecting Y_1 and Y_2. Do this by pressing ▲ ▲ ▲ ◀ **ENTER** ▼ **ENTER** .
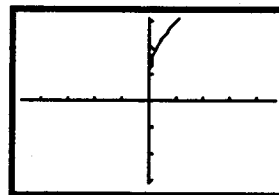
3. Press **ZOOM 4** to view the composition of Y_2 into Y_1 in the Decimal window.

Practice 18:

Graph the composition. Sketch what you see in the space provided.

1. f(x) = 2x + 1 and g(x) =√x

   g(f(x))

2. f(x) = 3x and g(x) =x + 1

   f(g(x))

3. f(x) = 3x and g(x) =x + 1

   g(f(x))

4. f(x) = -3x + 2 and g(x) =x – 2

   f(f(x))

Warm Up 19:
Solving Inequalities

Objective: To solve inequalities using the TI-83.

1. Press **Y=** and **CLEAR** to clear the Y_1 prompt. Press
    ▼ and **CLEAR** to clear additional prompts.
    Algebraically manipulate your inequality where the
    expression on one side of the inequality and zero is on the
    other side. Enter your expression for Y_1. For
    example, the inequality $2x - 1 \le 2$ would be re-written as
    $2x - 3 \le 0$. Enter the $2x - 3$ for Y_1 by pressing **2**
    X,T,θ,n **–** **3** .
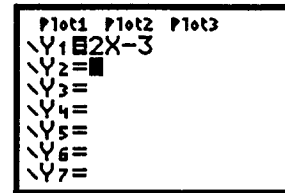
2. Press **ZOOM 4** to view the function in the Decimal
    window. The graph is equal to zero at the intersection of
    the graph with the x axis. Calculate the zero as shown in
    Warm Up 13. The intersection is (1.5, 0). This point
    reflects the x value where the inequality is equal to zero.

3. To find the solution set for the inequality, look at the graph
    by pressing **ZOOM 4** to see where the expression is
    below the x-axis or less than zero. The graph is less than
    zero left of the 1.5. The solution set is the interval
    (-oo, 1.5].
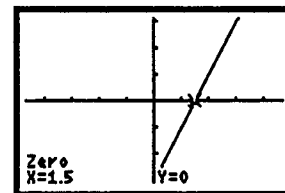
Practice 19:

Solve the inequality. Sketch the graph in the space provided.

1. $3x + 1 \le 2$

2. $x - 4 \ge 1$

3. $2x - 3 \le -2$

4. $4x - 5 \ge -3$

Warm Up 20:
Shading Inequalities

Objective: To shade inequalities using the TI-83.

1. Press **Y=** and **CLEAR** to clear the Y_1 prompt. Press ·▼· and **CLEAR** to clear additional prompts.

```
Plot1 Plot2 Plot3
\Y1=2X-3
\Y2=█
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

2. To shade the inequality $y < 2x - 3$, enter your expression for Y_1 by pressing **2 X,T,θ,n – 3** and view the graph by pressing **ZOOM 6** .

3. Shade the inequality by pressing **2nd DRAW 7** (-) **1 5 , VARS ▶ 1 1) ENTER** . The format is the lower bound followed by the upper bound. The -15 is below the window setting of -10. When working with a greater than, use a 15 as the upper bound.
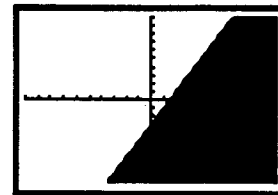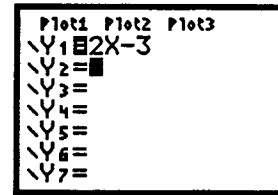
Practice 20:

Shade the inequality. Sketch what you see in the space provided.

1. $y \le 3x + 1$

2. $y \ge x - 4$

3. $y \le 2x - 3$

4. $y \ge 4x - 5$

Warm Up 21:
Using Formulas

Objective: To solve formulas using the TI-83.

1. Press **ON 2nd QUIT** to view the home screen. Press **CLEAR** to clear the screen.

2. You can easily calculate an answer to a formula on the graphing calculator. Remember to enclose items you want the calculator to compute first. For example, the formula for the circumference of circle is $C = 2\Pi r$, where r is the radius of the circle. Find the circumference of a circle with a radius of 6 feet by pressing **2 × 2nd Π × 6 ENTER** . In this calculation, the × symbols are not necessary but it is a good practice to get into. Notice the circumference is approximately 38 feet.

```
2*π*6
        37.69911184
■
```

3. The formula for the area of a triangle is $A = .5 b h$, where b is the base and h is the height. Find the area of a triangle with a base of 5 inches and a height 3 inches by pressing **. 5 × 5 × 3 ENTER** . Notice the area is approximately 7.5 square inches.

```
.5*5*3
             7.5
```

Practice 21:

Use the following formulas on your graphing calculator.

1. The formula for the height of an equilateral traingle is $H = \sqrt{3}\,s \div 2$, where s is the length of a side. Find the height of an equilateral triangle with a side of 4 inches.   = _____

2. The formula for the volume of a cone is $V = A * H \div 3$, where A is the area of the base and H is the height of the cone. Find the volume of a cone with height of 4 feet and an area of 20 square feet

= _____

3. The formula for the volume of a rectangular box is $V = l\, w\, h$, where l is the length, w is the width, and h is the height of the box. Find the volume of a rectangular box with a length of 5 feet, a width of 3 feet, and a height of 2 feet.

= _____

4. The formula for the area of a rectangle is $A = b * h$, where b is the length of the base and h is the length of the height. Find the area of a rectangle with a 7 inch base and 4 inch height.

= _____

Warm Up 22:
Systems of Equations

Objective: To solve a system of equations using the TI-83.

1. Press **Y=** and **CLEAR** to clear the Y_1 prompt. Press ▼ and **CLEAR** to clear additional prompts.

```
Plot1 Plot2 Plot3
\Y1B(X+9)/2
\Y2B-3X+1
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

2. To solve a system of two equations of two variables, you must first solve the equations for y explicitly in terms of x, and then enter the equations into Y_1 and Y_2. For example, to solve the system $-x + 2y = 9$ and $3x + y = 1$, you would rewrite the equations as $y = (x + 9)/2$ and $y = -3x + 1$.

3. Enter the first equation for Y_1 and the second equation for Y_2. Press **ZOOM 6** to view the graphs of the system of equations in the Standard viewing window.

```
Intersection
X=-1          Y=4
```

4. The intersection of the graphs represents the solution to the system of equations. Press **2nd CALC 5** to access the intersection calculation feature. Set the first curve by tracing near the intersection on the curve and pressing **ENTER**. Set the second curve by tracing near the intersection on the curve and pressing **ENTER ENTER**. If more than two equations are present, make sure your tracer is on the equations of interest. An accurate approximate for the intersection will appear at the bottom of the screen. The solution to the system of equations is $(x, y) = (-1, 4)$.
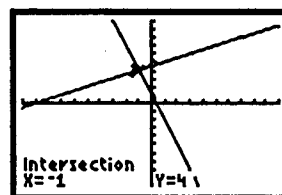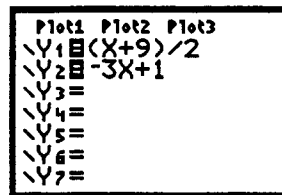
Practice 22:

Solve the system of equations. Sketch what you see in the space provided.

1. $x - y = 4$

   $-2x + 3y = 6$

2. $-x + 2y = 8$

   $3x - y = 3$

3. $x + y = 3$

   $2x - 3y = 6$

4. $x - 2y = 2$

   $4x + y = 4$

Warm Up 23:
Graphing Systems of Inequalities

Objective: To graph a system of inequalities using the TI-83.

1. Press **Y=** and **CLEAR** to clear the Y_1 prompt. Press **▼** and **CLEAR** to clear additional prompts.

2. To find the solution set for a system of two inequalities, you will first graph the equalities as Y_1 and Y_2. To do this, you must solve for y explicitly in terms of x. For example $3x + 2y \leq 12$ would be written as $y \leq (12 - 3x)/2$ and $x + 2y \leq 8$ as $y \leq (8 - x)/2$. Other conditions may exist such as $x \geq 0$ and $y \geq 0$, and these can be addressed with the viewing window.

3. Enter the equations for Y_1 and Y_2. Address the last two inequalities by pressing **WINDOW** and setting the viewing window to Xmin = 0, Xmax = 10, Xscl = 1, Ymin = 0, Ymax = 10, and Yscl = 1. Press **GRAPH** to view the equations.

4. Shade below the first inequality's graph (Y_1) by pressing **2nd DRAW 7 0 , VARS ▶ 1 1 , 0 , 1 0 , 1 , 2) ENTER** . Shade below the second inequality's graph (Y_2) by pressing **2nd DRAW 7 0 , VARS ▶ 1 2 , 0 , 1 0 , 2 , 2)ENTER** . The items separated by commas in the shade command are (in order) the lower bound, upper bound, left bound, right bound, pattern, and pattern resolution. Pattern 1 is a vertical line and pattern 2 is a horizontal line. A resolution of 2 tells the calculator to shade every other line. The region with the checkerboard design is the solution set for the system of inequalities.

```
Plot1 Plot2 Plot3
\Y1B(12-3X)/2
\Y2B(8-X)/2
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

```
Shade(0,Y1,0,10,
1,2)
Shade(0,Y2,0,10,
2,2)
■
```
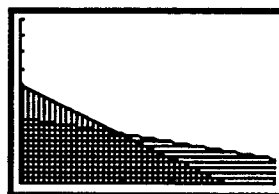
Practice 23:

Graph the system of inequality. Sketch what you see in the space provided.

1. $2x + 3y \geq 10$

   $2x + y \leq 8$

   $x \geq 0 \quad y \geq 0$

2. $x + 3y \leq 9$

   $-2x + y \geq -4$

   $x \geq 0 \quad y \geq 0$

Warm Up 24:
Looking For a Pattern

Objective: To extend patterns using the TI-83.

1. Press **ON 2nd QUIT** to view the home screen. Press **CLEAR** to clear the screen.

```
11+3
            14
Ans+3
            17
Ans+3
            20
■
```

2. Look for a pattern and then extend an arithmetic pattern on the graphing calculator. For example, notice that in the pattern 5, 8, 11, ... each term is 3 more than the prevoius term. Find additional terms by pressing **1 1 + 3 ENTER + 3 ENTER + 3 ENTER**.

3. Look for a pattern and then extend a geometric pattern on the graphing calculator. For example, notice that in the pattern 2, 8, 32, ... each term is 4 times the previous term. Find additional terms by pressing **3 2 × 4 ENTER × 4 ENTER × 4 ENTER**. Continuing to press **ENTER** will repeatedly multiply by four.

```
32*4
            128
Ans*4
            512
           2048
```

Practice 24:
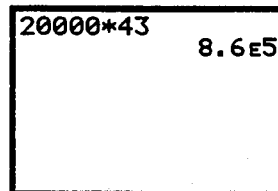
Look for a pattern and find the additional terms.

1. 62, 56, 50, ___, ___, ___

2. 147, 137, 127, ___, ___, ___

3. 243, 81, 27, ___, ___, ___

4. 7, 13, 19, ___, ___, ___

5. .004, .04, .4, ___, ___, ___

6. 5, 15, 45, ___, ___, ___

         Easy Warm Ups in Algebra/TI-83

Warm Up 25:
Scientific Notation
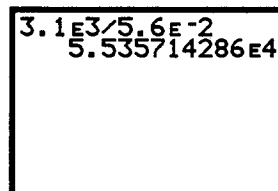
Objective: To perform calculations in scientific notation using the TI-83.

1. To get answers in scientific notation, change the mode by pressing **MODE ▶ ENTER**. Multiply 20000 • 43 by pressing **2nd QUIT CLEAR 2 0 0 0 0 × 4 3 ENTER**.

```
20000*43
              8.6E5
```

2. Enter a calculation with numbers in scientific notation, such as $(3.1 \times 10^3) \div (5.6 \times 10^{-2})$ by pressing **3 . 1 2nd EE 3 ÷ 5 . 6 2nd EE (-) 2 ENTER**.

```
3.1E3/5.6E-2
         5.535714286E4
```

Practice 25:

Find the answers in scientific notation.

1. $8493 \div .054 = $ _____

2. $75{,}843 \times 635 = $ _____

3. $623{,}784 \div .634 = $ _____

4. $3{,}733 \times 2{,}635 = $ _____

5. $(2.313 \times 10^3) \div (7.57 \times 10^{-3}) = $ _____

6. $(5.431 \times 10^4) \times (4.86 \times 10^5) = $ _____

7. $(4.21 \times 10^5) \div (5.6 \times 10^{-4}) = $ _____

Warm Up 26:
Graphing Quadratic Equations

Objective: To graph quadratic equations using the TI-83.

1. Press **Y=** and **CLEAR** to clear the Y_1 prompt. Press ▼ and **CLEAR** to clear additional prompts.

2. To graph equations, for example, the equation $y = x^2 + 1$, enter the equation $y = x^2 + 1$ for Y_1 by moving the blinking cursor to the Y_1 prompt and pressing **X,T,θ ,n** $x^2 + 1$ **ENTER**.

3. Set the viewing window to a standard viewing window and view the graph of the equation by pressing **ZOOM 6** (ZStandard).

```
Plot1  Plot2  Plot3
\Y1▤X²+1
\Y2=█
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```
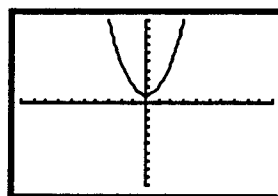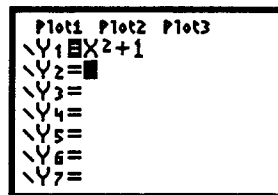
Practice 26:

Graph each quadratic equation in the standard viewing window. Sketch what you see in the space below each equation.

1. $y = -x^2 + 3$

2. $y = x^2 - 4x + 5$

3. $y = x^2 + 4x - 5$

4. $y = -2x^2 - 6x - 3$

Warm Up 27:
Solving Quadratic Equations by Graphing

Objective: To solve a quadratic equation using the TI-83.

1. Press **Y=** and **CLEAR** to clear the Y_1 prompt. Press ▼ and **CLEAR** to clear additional prompts.

2. Set the equation equal to zero. Enter your equation for Y_1. For example, enter $3x^2 - 2 = 0$ for Y_1 by pressing **3 X,T,θ,n x^2 − 2 ENTER**. Press **ZOOM 4** to view the equation in the decimal window.

3. Find where the equation is equal to zero by pressing **2nd CALC 2** (zero), set the lower bound for the calculation by moving the cursor to the left (above in this case) of the left zero by pressing ◄ and then press **ENTER**. Set the upper bound for the calculation by pressing ► to move the cursor to the right (below in this case) of the zero and press **ENTER ENTER**. An accurate approximate for the left zero will appear at the bottom of the screen. Repeat for the right zero.
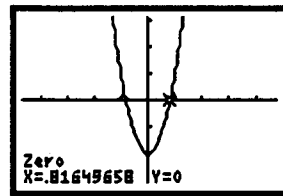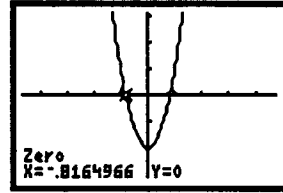
Practice 27:

Find the solution to the equation. Sketch what you see in the space provided.

1. $7x^2 - 5 = 0$

2. $-6x^2 + 5 = 0$

3. $5x^2 - 4x - 2 = 0$

4. $-4x^2 + 5x + 1 = 0$

Warm Up 28:
Graphing Exponential Functions

Objective: To graph exponential equations using the TI-83.

1. Press **Y=** and **CLEAR** to clear the Y_1 prompt. Press
   ▼ and **CLEAR** to clear additional prompts.

2. To graph an exponential equation, for example, the
   equation $y = 2^x$, enter the equation $y = 2^x$ for Y_1 by
   moving the blinking cursor to the Y_1 prompt and pressing
   2 **^** **X,T,θ ,n** **ENTER** .

```
Plot1 Plot2 Plot3
\Y1=2^X
\Y2=█
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

3. Set the viewing window to the decimal viewing window
   and view the graph of the equation by pressing **ZOOM**
   4 (ZDecimal).
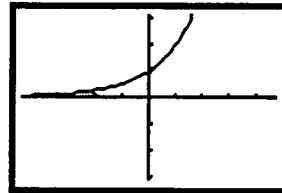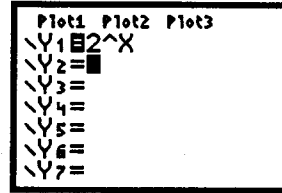
Practice 28:

Graph each exponential equation in the decimal viewing window. Sketch what you
see in the space below each equation.

1. $y = 3^x$

2. $y = -4^x$

3. $y = (1.5)^{-x}$

4. $y = (1/2)^x$

Warm Up 29:
Graphing Rational Functions

Objective: To graph rational functions using the TI-83.

1. Press **Y=** and **CLEAR** to clear the Y_1 prompt. Press
    ▼ and **CLEAR**   to clear additional prompts.

2. To graph a rational function, for example, the equation
    $y = (x + 1)/(x^2 + 1)$, enter the equation for Y_1 by moving
    the blinking cursor to the Y_1 prompt and pressing   (
    X,T,θ ,n + 1) ÷ (X,T,θ ,n x^2 + 1) ENTER .
    Notice the numerator and denominator are enclosed in
    parentheses.

3. Set the viewing window to the decimal viewing window
    and view the graph of the equation by pressing **ZOOM**
    4 (ZDecimal).

```
Plot1  Plot2  Plot3
\Y1◻(X+1)/(X2+1)
\Y2=∎
\Y3=
\Y4=
\Y5=
\Y6=
```
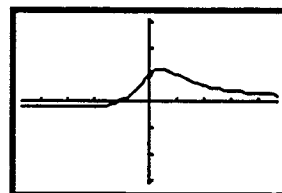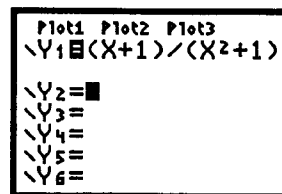
Practice 29:

Graph each rational equation in the decimal viewing window. Sketch what you
see in the space below each equation.

1. $y = 3/(x - 2)$

2. $y = x/(x^2 - 1)$

3. $y = 4/(x^2 + 2x + 1)$

4. $y = (x^2 + 1)/(x^3 - 1)$

Easy Warm Ups in Algebra/TI-83

Warm Up 30:
Graphing Radical Functions

Objective: To graph radical functions using the TI-83.

1. Press **Y=** and **CLEAR** to clear the Y_1 prompt. Press
   ▼ and **CLEAR** to clear additional prompts.

```
Plot1  Plot2  Plot3
\Y1▊√(X+1)
\Y2=
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```

2. To graph a radical function, for example, the equation
   $y = \sqrt{(x + 1)}$, enter the equation for Y_1 by moving
   the blinking cursor to the Y_1 prompt and pressing **2nd** √‾
   X,T,θ,n **+** **1** **)** **ENTER** . Notice the expression under
   the radical is enclosed in parentheses.

3. Set the viewing window to the decimal viewing window
   and view the graph of the equation by pressing **ZOOM**
   4 (ZDecimal).
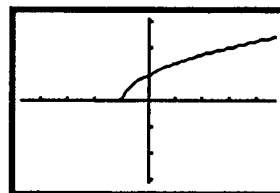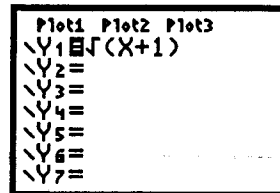
Practice 30:

Graph each radical equation in the decimal viewing window. Sketch what you
see in the space below each equation.

1. $y = \sqrt{(x - 2)}$

2. $y = \sqrt{(x^2 - 1)}$

3. $y = \sqrt{(2x + 1)}$

4. $y = -\sqrt{(4x - 1)}$

Easy Warm Ups in Algebra/TI-83

Warm Up 31:
Graphing Absolute Value Functions

Objective: To graph absolute value functions using the TI-83.

1. Press **Y=** and **CLEAR** to clear the Y_1 prompt. Press
   ▼ and **CLEAR** to clear additional prompts.

2. To graph an absolute value function, for example, the
   equation $y = |x + 1|$, enter the equation for Y_1 by moving
   the blinking cursor to the Y_1 prompt and pressing **MATH**
   ▶ 1 X,T,θ,n + 1) ENTER . Notice the expression
   within the absolute value is enclosed in parentheses.

3. Set the viewing window to the decimal viewing window
   and view the graph of the equation by pressing **ZOOM**
   4 (ZDecimal).

```
Plot1 Plot2 Plot3
\Y1█abs(X+1)
\Y2=█
\Y3=
\Y4=
\Y5=
\Y6=
\Y7=
```
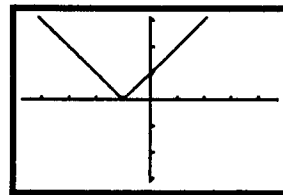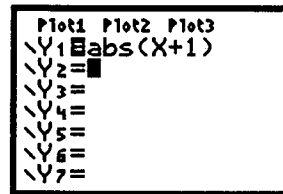

Practice 31:

Graph each absolute value equation in the decimal viewing window. Sketch what you
see in the space below each equation.

1. $y = |x - 2|$

2. $y = |x^2 - 1|$

3. $y = |2x + 1|$

4. $y = -|4x^2 - 1|$

Warm Up 32:
Absolute Value Inequalities

Objective: To solve absolute value inequalities using the TI-83.

1. Press **Y=** and **CLEAR** to clear the Y_1 prompt. Press ▼ and **CLEAR** to clear additional prompts.

2. Enter one side of the absolute value inequality for Y_1 and the other side for Y_2. For example, the equation

   $|x^2 + x - 2| \geq 3$ would be entered as abs($x^2 + x - 2$) for Y_1 and 3 for Y_2.

3. Press **ZOOM 6** to view the equations in the Standard window.

4. The expression is equal to three at the intersection of the horizontal line (y = 3) and the curve. Calculate the intersections by pressing **2nd CALC 5 ENTER ENTER**, move the tracer near the left intersection and press **ENTER**. Repeat for the right intersection. The intersections are approximately (-2.79, 3) and (1.79, 3). To find the solution set for the inequality, look at the graph to see where the expression is greater than 3 (above the horizontal line). The graph is above the horizontal line to the right of the right-hand intersection and to the left of the left-hand intersection. Therefore, the solution set is the interval (-oo, -2.79] ∪ [1.79, oo).
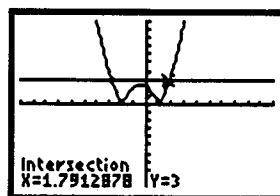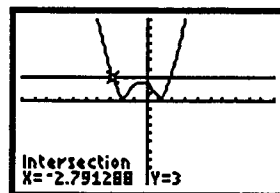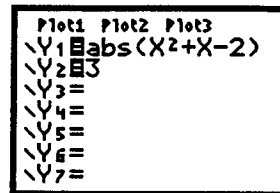
Practice 32:

Solve the absolute value inequalities. Sketch what you see in the space provided.

1. $|x^2 - 2x - 1| \leq 4$

2. $|2x^2 + 3x - 1| \geq 3$

Answer Key

Practice 1:

1. 1/2   **2.** 53/200   **3.** 43/50   **4.** 51/100

5. 3/4   **6.** 7/10

Practice 2:

1. .06   **2.** 1   **3.** -125   **4.** .11

5. 243   **6.** 2.07   **7.** >   **8.** >

9. <   **10.** >

Practice 3:

1. 2.65   **2.** 1.58   **3.** -4.24   **4.** 7.42

5. .98   **6.** .68   **7.** -.91   **8.** .97

Practice 4:

1. 20   **2.** 9   **3.** 72   **4.** 2

5. 20   **6.** 36

Practice 5:

1. 2.25, 2   **2.** 7.1, 4.5   **3.** 4.91, 4   **4.** 13.86, 14

Practice 6:

1.
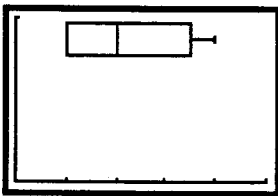
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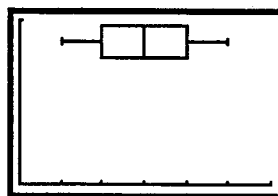
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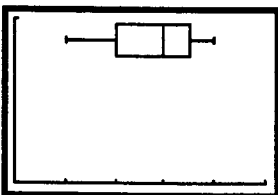
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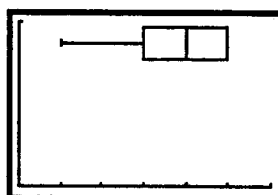
Practice 7:

1. .02   **2.** .13   **3.** .06   **4.** 0

5. .13   **6.** .33

Practice 8:

1. .36, .10   **2.** 193, 265   **3.** 16,983, -1,340,157

4. 157, 18.6

Practice 9:

1. 420, 338   **2.** 11,638, 41,650   **3.** 49.56, 32.20   **4.** 5,436, 74,562

Practice 10:

1.
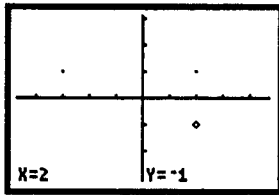
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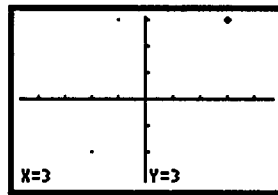
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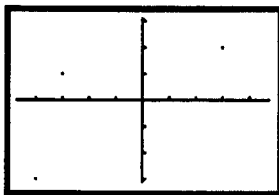
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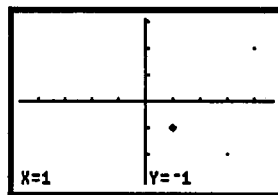
Practice 11:

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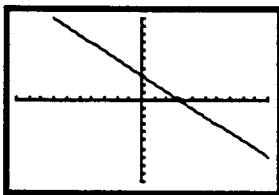
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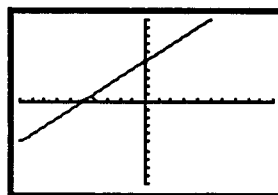
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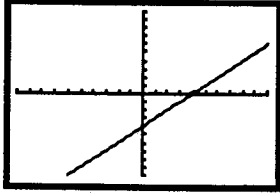
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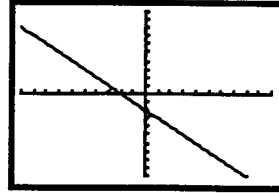
Practice 12:

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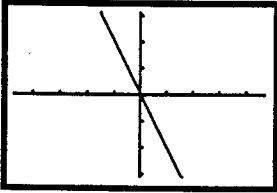
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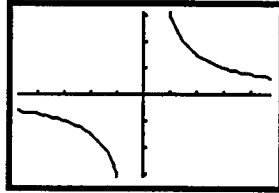
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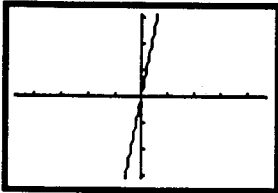
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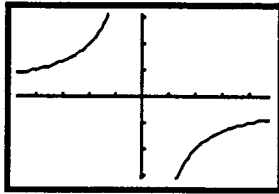
Practice 13:

1. -.29	**2.** .5	**3.** .8	**4.** 1.25
5. -.67	**6.** 1.5		

Practice 14:

1. .28	**2.** 2	**3.** -2.33	**4.** -.11
5. .67	**6.** .57		

Practice 15:

1.
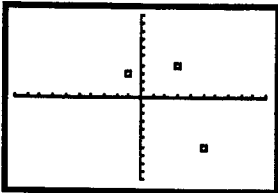
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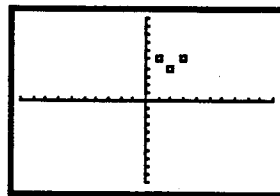
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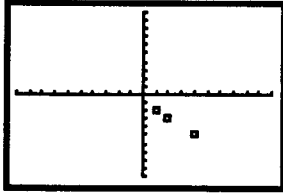
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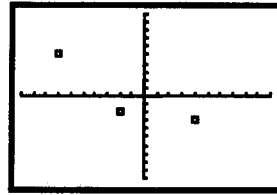
Practice 16:

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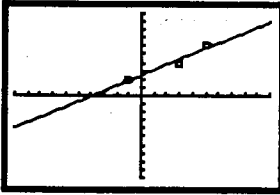
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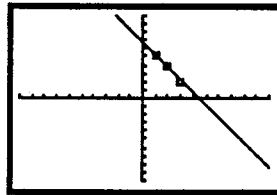
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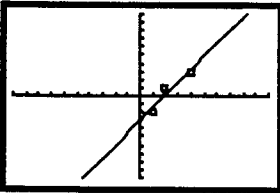
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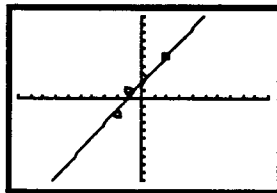
Practice 17:

1. 13, 5, 36, 2.25   **2.** -1, -9, -20, -1.25   **3.** 25.24, -24.76, 5.90, .01

Practice 18:

1.
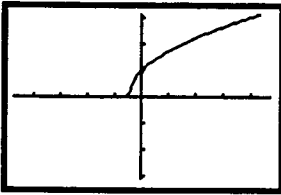
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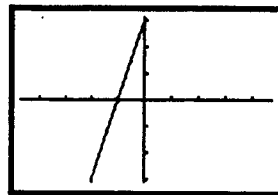
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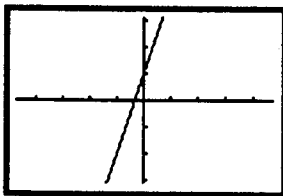
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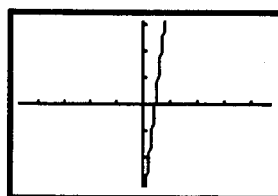
Practice 19:

1. (-∞,0]   **2.** [5,∞)   **3.** (-∞,.5]   **4.** [.5,∞)

Practice 20:

1.
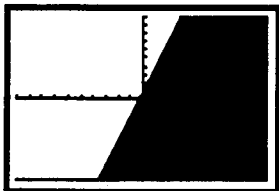
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3.
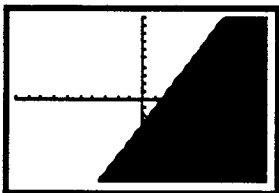
4.

Practice 21:

1. 3.46   **2.** 26.66   **3.** 30   **4.** 28

Practice 22:

1. (18,14)   **2.** (2.8,5.4)   **3.** (3,0)   **4.** (1.11,-.44)

Practice 23:

1.
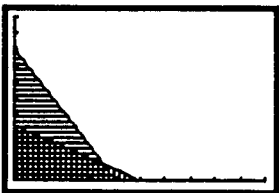
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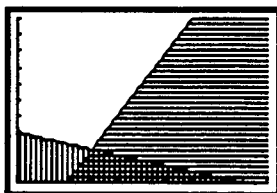
Practice 24:

1. 44, 38, 32   **2.** 117, 107, 97   **3.** 9, 3, 1   **4.** 25, 31, 37
5. 4, 40, 400   **6.** 135, 405, 1215

Practice 25:

1. 1.57×10^5 **2.** 4.82×10^7 **3.** 9.84×10^5 **4.** 9.84×10^6

5. 3.06×10^5 **6.** 2.64×10^{10} **7.** 7.52×10^8

Practice 26:

1.
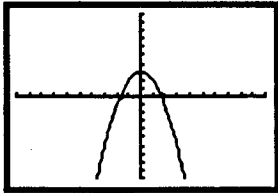
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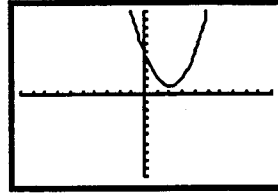
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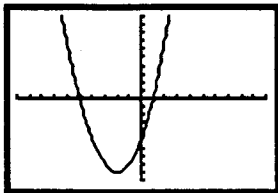
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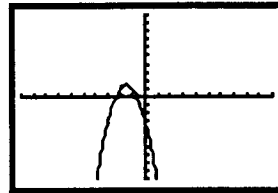
Practice 27:

1. (.85,0) (-.85,0)   **2.** (.91,0) (-.91,0)   **3.** (1.15,0) (-.35,0)   **4.** (1.43, 0) (-.18,0)

Practice 28:

1.
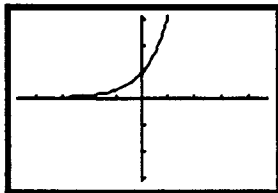
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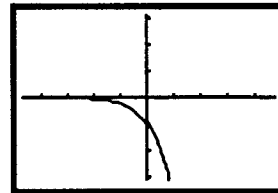
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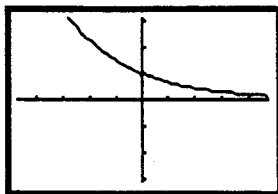
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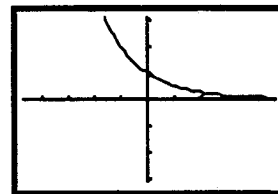
Practice 29:

1.

2.
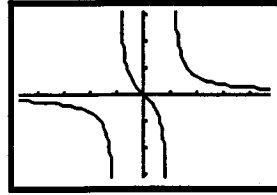
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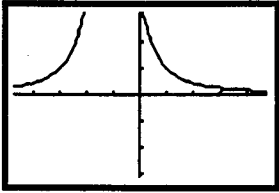
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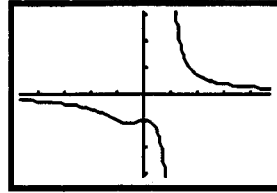
Practice 30:

1.

2.

3.

4.

Practice 31:

1.

2.

Easy Warm Ups in Algebra/TI-83
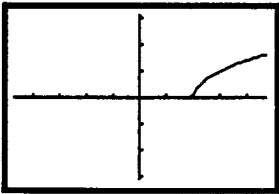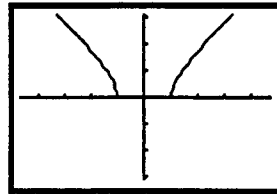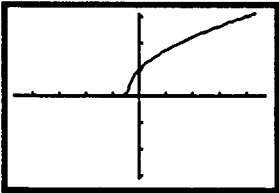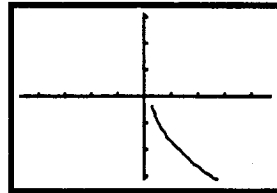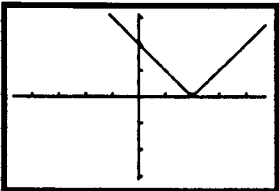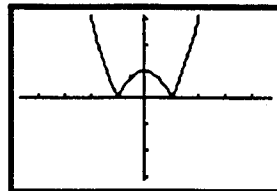
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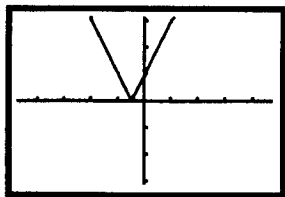
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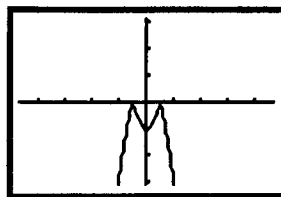
Practice 32:

1. [-1.45, 3.45]   **2.** (-∞, -2.35] ∪ [.85, ∞)

         Easy Warm Ups in Algebra/TI-83