

Review Night #2

Section 1. Linear Graphing – 3 Techniques.

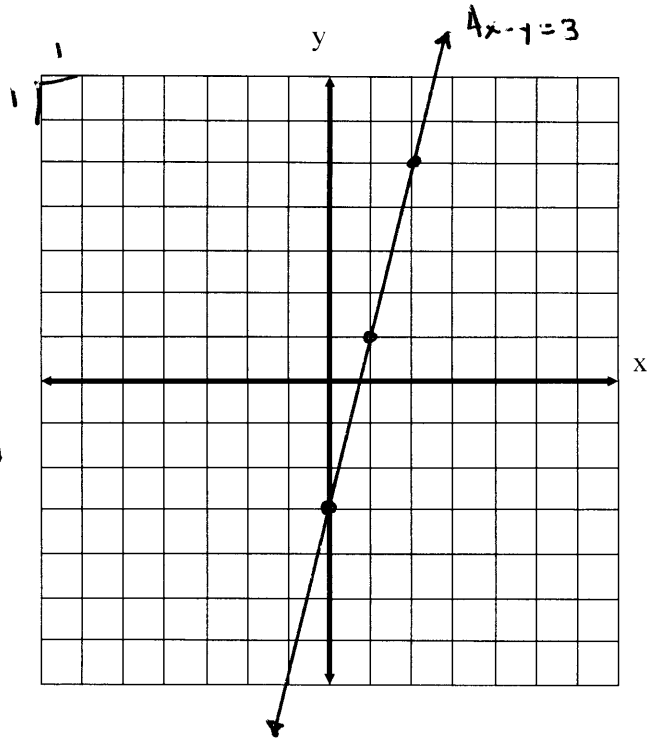
1. "Plug and Chug." Choose several (minimum of 3) x-values, and substitute to determine corresponding y-values. Be sure to show all arithmetic

a. $4x - y = 3$

x	y
1	5
2	5
3	9

New Point

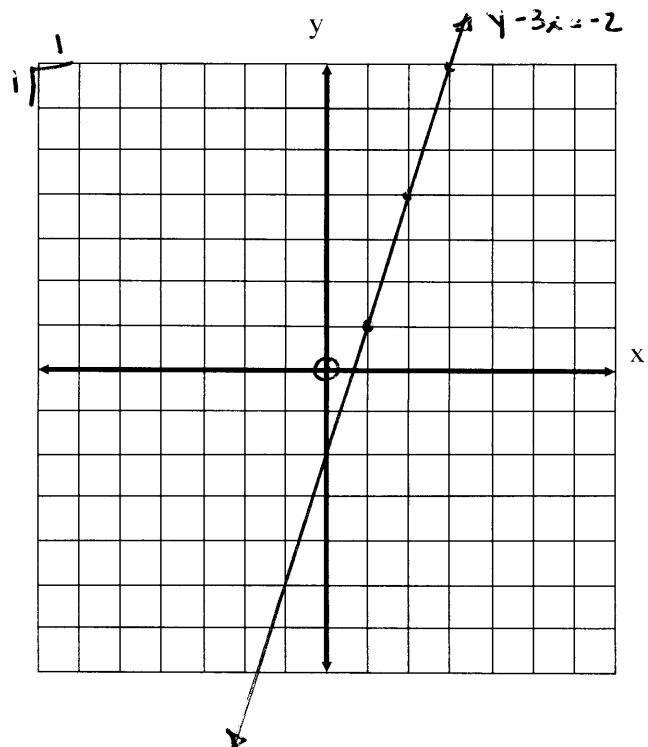
$$\begin{aligned}
 4(1) - 1 &= 3 \\
 4 - 1 &= 3 \\
 4(2) - 5 &= 3 \\
 8 - 5 &= 3 \\
 4(3) - 9 &= 3 \quad \text{+ Does Not Fit} \\
 12 - 9 &= 3 \\
 4(0) - (-3) &= 3 \\
 0 + 3 &= 3 \\
 3 &= 3 \checkmark
 \end{aligned}$$



b. $y - 3x = -2$

x	y
1	1
2	4
3	1

$$\begin{aligned}
 1 - 3(1) &= -2 \\
 1 - 3 &= -2 \\
 -2 &= -2 \\
 4 - 3(2) &= -2 \\
 4 - 6 &= -2 \\
 -2 &= -2 \\
 1 - 3(3) &= -2 \\
 1 - 9 &= -2 \\
 -2 &= -2
 \end{aligned}$$

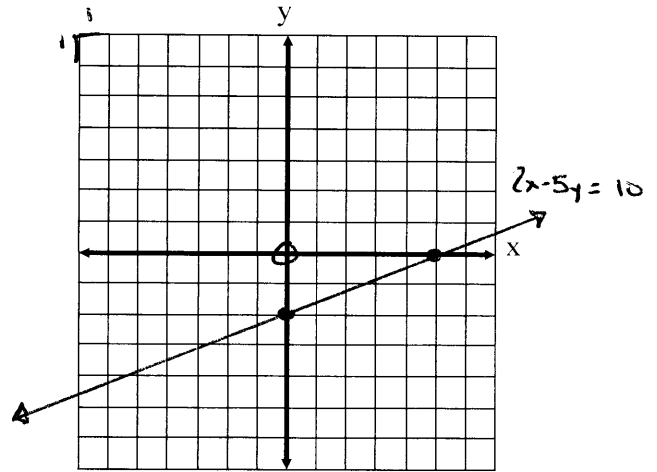


2. X and Y Intercepts. NOTE: After finding the x and y intercepts for the following graphs, please state the ACTUAL COORDINATES for the points themselves.

a. $2x - 5y = 10$

Work:

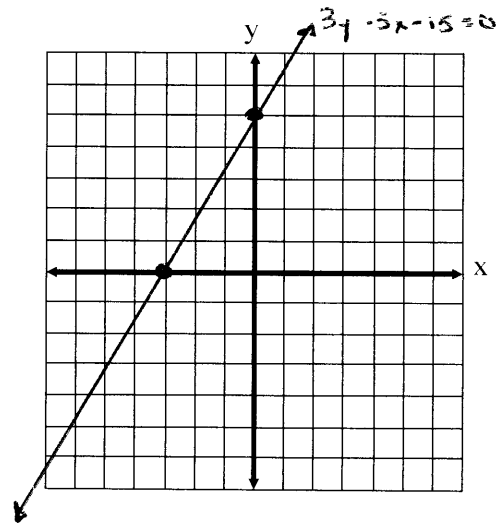
$$\begin{array}{l} x=0 \qquad y=0 \\ 2(0) - 5y = 10 \qquad 2x - 5(0) = 10 \\ -5y = 10 \qquad 2x = 10 \\ y = -2 \qquad x = 5 \\ @ (0, -2) \qquad @ (5, 0) \end{array}$$



b. $3y - 5x - 15 = 0$

Work:

$$\begin{array}{l} x=0 \qquad y=0 \\ 3y - 5(0) - 15 = 0 \qquad 3(0) - 5x - 15 = 0 \\ 3y - 15 = 0 \qquad -5x - 15 = 0 \\ +15 \quad +15 \qquad +15 \quad +15 \\ 3y = 15 \qquad -5x = 15 \\ y = 5 \qquad x = -3 \\ @ (0, 5) \qquad @ (-3, 0) \end{array}$$



The Algebra of Intercepts: Find the coordinates for the intercepts:

State the x and y intercepts by their coordinates.

c. $f(x) = 3x + 2$

$$\begin{array}{l} \text{At } x=0 \qquad \text{At } y=0 \\ f(x) = y \qquad f(x) = y \\ y = 3(0) + 2 \qquad 0 = 3x + 2 \\ y = 0 + 2 \qquad -2 = 3x \\ y = 2 \qquad -\frac{2}{3} = x \end{array}$$

d. $f(x) = 15 - 3x$

$$\begin{array}{l} \text{At } x=0 \qquad \text{At } y=0 \\ y = 15 - 3(0) \qquad 0 = 15 - 3x \\ y = 15 \qquad +3x \quad +3x \\ 3x = 15 \\ x = 5 \end{array}$$

c. $(0, 2)$ and $(-\frac{2}{3}, 0)$

d. $(0, 15)$ and $(5, 0)$

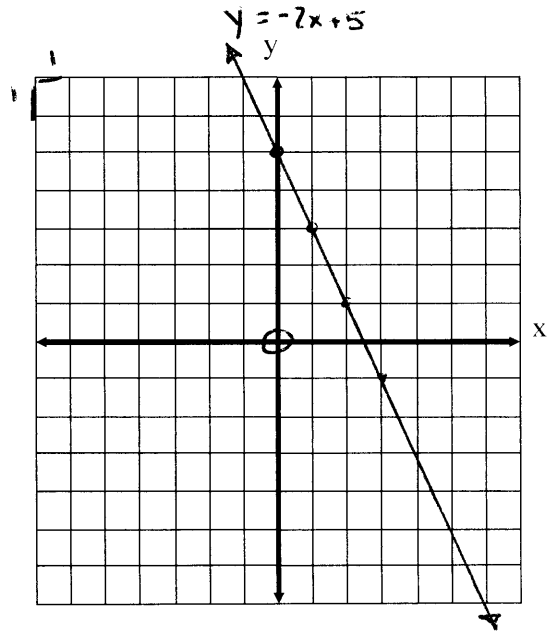
Graphing Lines by Slope-Intercept Method: $y = mx + b$.
 Name at least 2 points on this line. State the slope and the y-intercept (coordinates).

3. $y = -2x + 5$

$$m = -\frac{2}{1} = \frac{\Delta y}{\Delta x}$$

$$b = +5$$

$$y\text{-intercept } (0, 5)$$



4. $3x + 2y = 6$

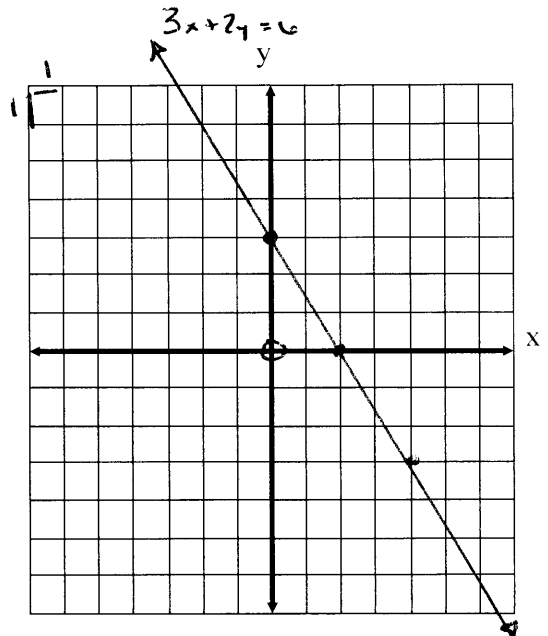
$$\frac{2y}{2} = -\frac{3x}{2} + \frac{6}{2}$$

$$y = -\frac{3}{2}x + 3$$

$$m = -\frac{3}{2} = \frac{\Delta y}{\Delta x}$$

$$b = +3$$

$$y\text{-int} = (0, 3)$$



5. $4x - 8y = 16$

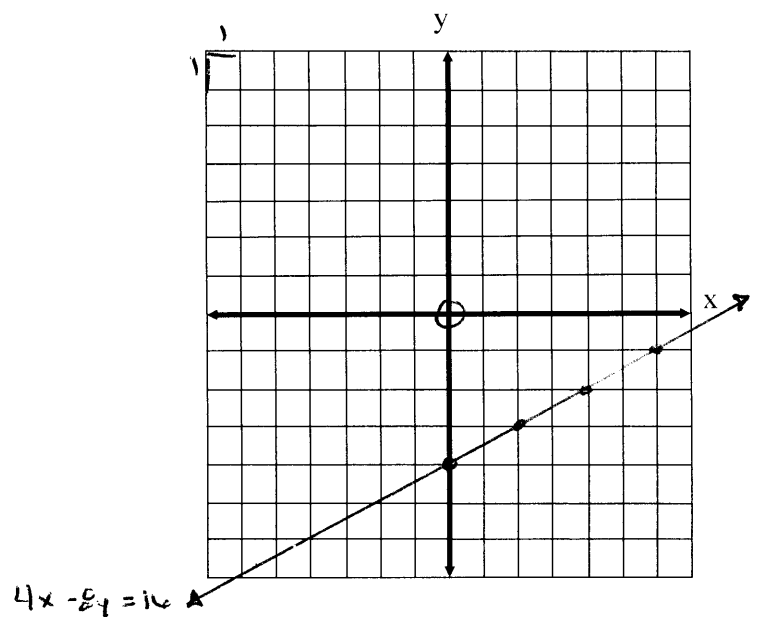
$$\frac{-8y}{-8} = \frac{-4x}{-8} + \frac{16}{-8}$$

$$y = +\frac{1}{2}x - 4$$

$$m = \frac{1}{2} = \frac{\Delta y}{\Delta x}$$

$$b = -4$$

$$y\text{ int} = (0, -4)$$



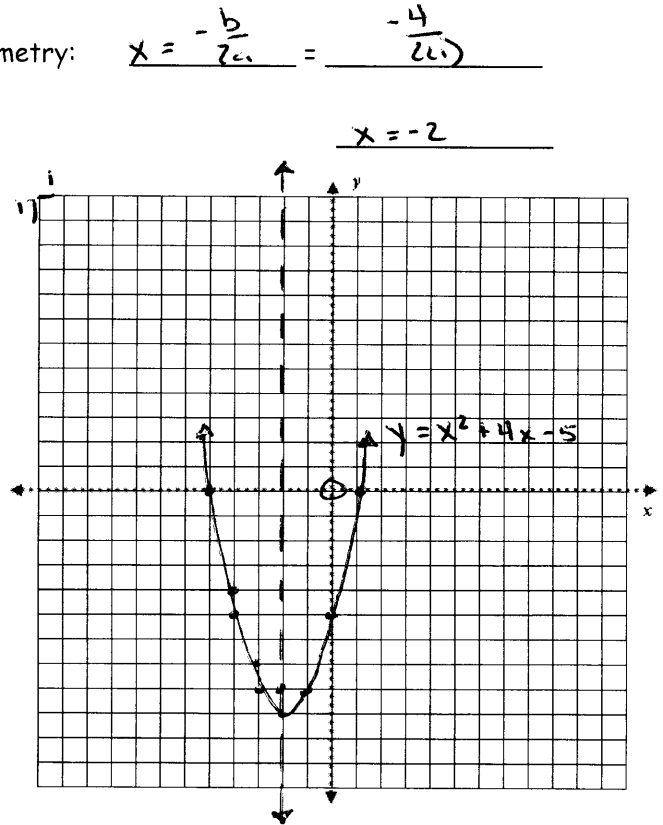
Section 3. Graphing the 2nd Degree (Parabola) Equation on the Coordinate Axes.

1. $y = x^2 + 4x - 5$ Axis of Symmetry: $x = \frac{-b}{2a} = \frac{-4}{2(1)}$

$a = 1$ $b = +4$ $c = -5$

$D = \underline{-5 \quad -4 \quad -3 \quad -2 \quad -1 \quad 0 \quad 1}$

x		$y = x^2 + 4x - 5$
-5	0	$y = (-5)^2 + 4(-5) - 5$
-4	-5	$y = (-4)^2 + 4(-4) - 5$
-3	-8	$y = (-3)^2 + 4(-3) - 5$
-2	-9	$y = (-2)^2 + 4(-2) - 5$
-1	-8	$y = (-1)^2 + 4(-1) - 5$
0	-5	$y = (0)^2 + 4(0) - 5$
1	0	$y = (1)^2 + 4(1) - 5$

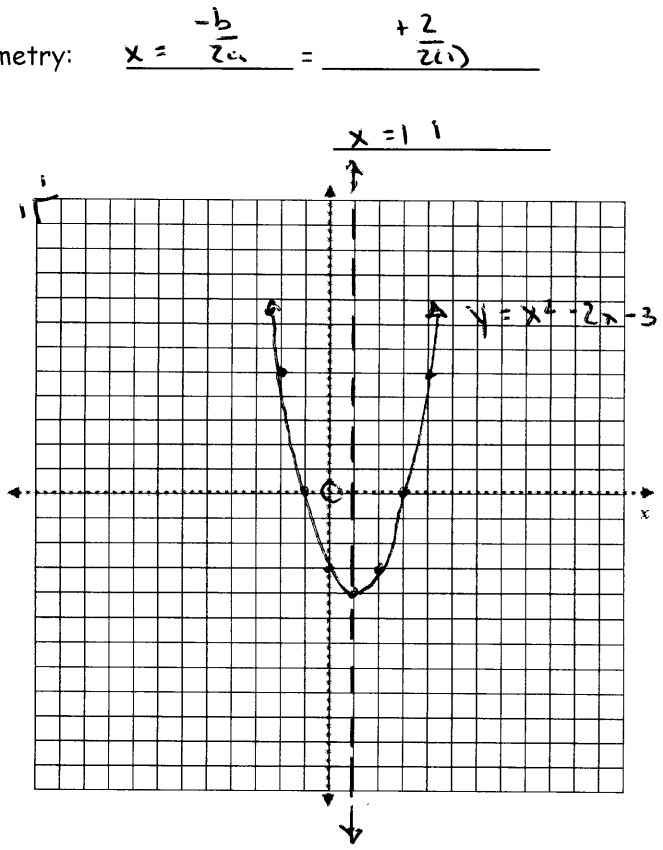


2. $y = x^2 - 2x - 3$ Axis of Symmetry: $x = \frac{-b}{2a} = \frac{+2}{2(1)}$

$a = 1$ $b = -2$ $c = -3$

$D = \underline{-2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4}$

x		$y = x^2 - 2x - 3$
-2	5	$y = (-2)^2 - 2(-2) - 3$
-1	0	$y = (-1)^2 - 2(-1) - 3$
0	-3	$y = (0)^2 - 2(0) - 3$
1	-4	$y = (1)^2 - 2(1) - 3$
2	-3	$y = (2)^2 - 2(2) - 3$
3	0	$y = (3)^2 - 2(3) - 3$
4	5	$y = (4)^2 - 2(4) - 3$



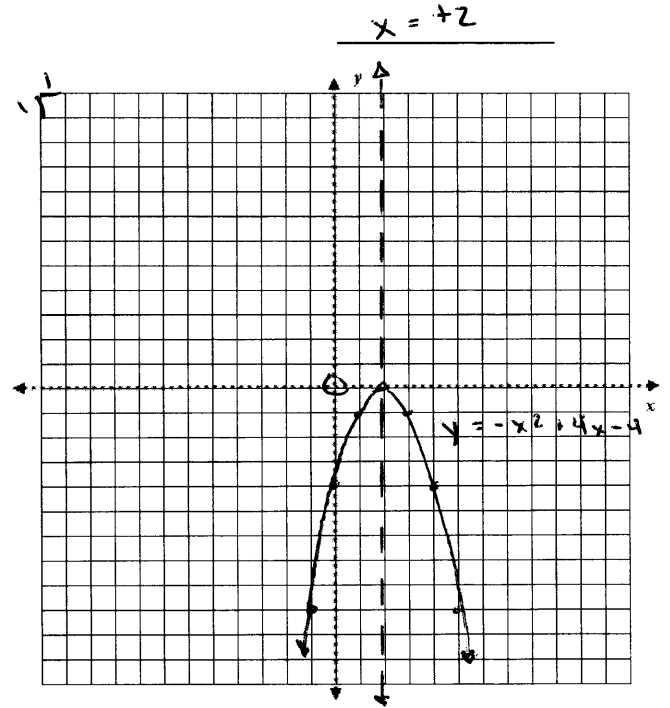
3. $y = -x^2 + 4x - 4$

Axis of Symmetry: $x = \frac{-b}{2a} = \frac{-4}{2(-1)}$

$a = -1$ $b = +4$ $c = -4$

$D = -1 \ 0 \ 1 \ 2 \ 3 \ 4 \ 5$

x		$y = -x^2 + 4x - 4$
-1	-9	$y = -(-1)^2 + 4(-1) - 4$
0	-4	$y = -(0)^2 + 4(0) - 4$
1	-1	$y = -(1)^2 + 4(1) - 4$
2	0	$y = -(2)^2 + 4(2) - 4$
3	-1	$y = -(3)^2 + 4(3) - 4$
4	-4	$y = -(4)^2 + 4(4) - 4$
5	-9	$y = -(5)^2 + 4(5) - 4$



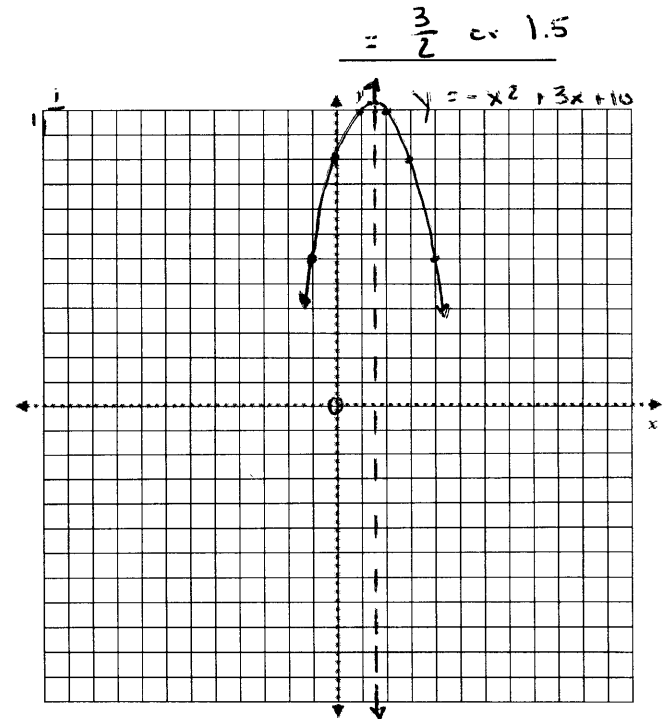
3. $y = -x^2 + 3x + 10$

Axis of Symmetry: $x = \frac{-b}{2a} = x = \frac{-3}{2(-1)}$

$a = -1$ $b = +3$ $c = +10$

$D = -1 \ 0 \ 1 \ 1.5 \ 2 \ 3 \ 4$

x		$y = -x^2 + 3x + 10$
-1	6	$y = -(-1)^2 + 3(-1) + 10$
0	10	$y = -(0)^2 + 3(0) + 10$
1	12	$y = -(1)^2 + 3(1) + 10$
1.5	12.5	$y = -(1.5)^2 + 3(1.5) + 10$
2	12	$y = -(2)^2 + 3(2) + 10$
3	10	$y = -(3)^2 + 3(3) + 10$
4	6	$y = -(4)^2 + 3(4) + 10$



Section 4. Multiplication and Division of Fractions

1. Reduce: $\frac{x^2 + 5x}{x^2 - 25}$

$$= \frac{x(x+5)}{(x+5)(x-5)}$$

$$= \frac{x}{(x-5)}$$

2. Reduce: $\frac{x^2 - 2x - 3}{x^2 + 2x - 15}$

$$= \frac{(x+1)(x-3)}{(x+5)(x-3)}$$

$$= \frac{(x+1)}{(x+5)}$$

3. Simplify: $\frac{14x^3y^2}{x^2 - 5x} \cdot \frac{10x - 50}{21x^2y}$

$$= \frac{\cancel{14}^2 \cancel{x^3}^x \cancel{y^2}^y}{x(x-5)} \cdot \frac{10(x-5)}{\cancel{21}^3 \cancel{x^2}^x y}$$

$$= \frac{20y}{3}$$

4. Divide: $\frac{(x-9)^2}{x^2 - 81} \div \frac{10x - 90}{5x + 45}$

Factor and Take Reciprocal 2nd Function

$$\frac{(x-9)(x-9)}{(x+9)(x-9)} \cdot \frac{5(x+9)}{10(x-9)}$$

$$= \frac{1}{2}$$

Write in Proper Scientific Notation:

5. 125.4×10^{-5} 1.254×10^{-3}

6. 0.0453×10^6 4.53×10^4

Simplify: Take Your Time.

7. $\frac{14.25 \times 10^9}{(1.35 \times 10^4)(5.30 \times 10^{-2})}$

$$\frac{14.25 \times 10^9}{7.155 \times 10^2}$$

$$= 1.991614256 \times 10^7$$

$$= 1.99 \times 10^7$$

8. $\frac{(5.25 \times 10^3)(4.25 \times 10^{-7})}{(5.70 \times 10^{-10})}$

$$= \frac{22.3125 \times 10^{-4}}{5.70 \times 10^{-10}}$$

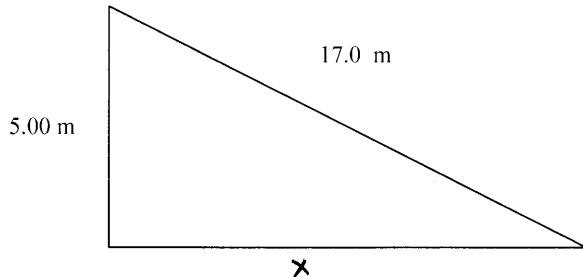
$$= 3.914473684 \times 10^6$$

$$= 3.91 \times 10^6$$

Resolve the Following: Use an Acceptable Technique. All answers need to be in proper significant digits.

1. Find the perimeter for the right triangle.

1. 38.2 m



$$x^2 + (5.00)^2 = (17.0)^2$$

$$x^2 + 25 = 289$$

$$- 25 \quad - 25$$

$$\sqrt{x^2} = \sqrt{264}$$

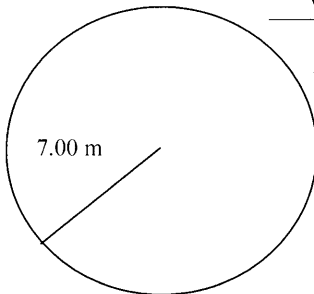
$$x = 16.24807681$$

$$x = 16.2$$

$$\begin{array}{r} 5.00 \\ + 17.0 \\ \hline 16.2 \\ \hline = 38.2 \text{ m} \end{array}$$

2. Find the Circumference for the following circles. Write the formula that you use on the line provided.

a.



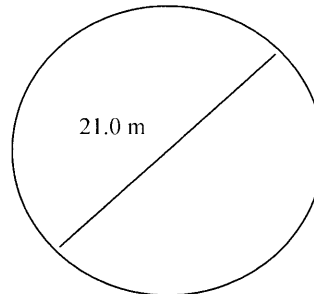
$$C = 2\pi r$$

$$= 2(3.14)(7.00)$$

$$= 43.96 \text{ m}$$

$$= 44.0 \text{ m}$$

b.



$$C = \pi d$$

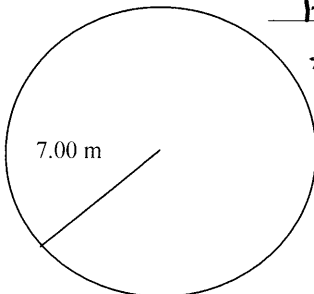
$$= (3.14)(21.0)$$

$$= 65.94 \text{ m}$$

$$= 65.9 \text{ m}$$

3. Find the Area for the following circles. Write the formula that you use on the line provided.

a.



$$A = \pi r^2$$

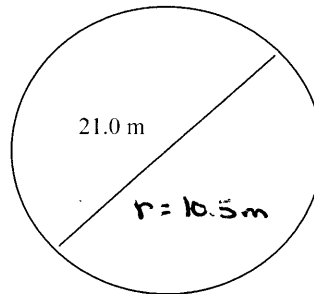
$$= (3.14)(7.00)^2$$

$$= (3.14)(49.0)$$

$$= 153.86 \text{ m}^2$$

$$= 154 \text{ m}^2$$

b.



$$A = \pi r^2$$

$$= (3.14)(10.5)^2$$

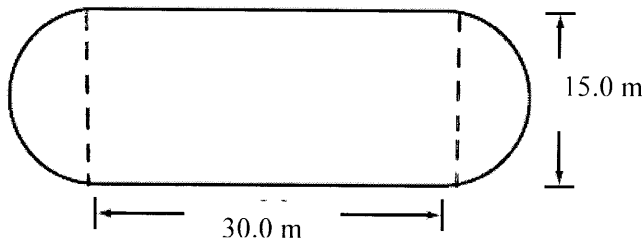
$$= (3.14)(110.25)$$

$$= 346.185 \text{ m}^2$$

$$= 346 \text{ m}^2$$

4. Find the Area for the following figures. Write the formula that you use on the line provided.

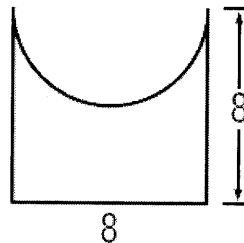
a. $A_T = 627.25$



One Rectangle $A = L \times W$
 $= (30.0)(15.0)$
 $= 450 \text{ m}^2$

One Circle $A = \pi r^2$
 $= (3.14)(7.5)^2$
 $= (3.14)(56.25)$
 $= 176.625$

b. $A_T = 38.9$



One Square $A = L \times W$
 $= 8 \times 8$
 $= 64$

One 1/2 Circle $A = \frac{1}{2} \pi r^2$
 $= \frac{1}{2} \pi (4)^2$
 $= .5(3.14)(16)$
 $= 25.12$

Variation Section.

Formulas in Play:

Varies Directly:

$y = kx$

Varies Indirectly:

$y = \frac{k}{x}$

Varies Directly As Square:

$y = x^2$

Varies Indirectly as Square:

$y = \frac{k}{x^2}$

1. The time t that it takes to travel a fixed distance varies inversely as the rate r at which one travels. Express t as a function of r . Solve for the value of the constant k when $t = 4$ and $r = 55$. Find the value of t when $r = 45$.

$t = \frac{k}{r}$

$4 = \frac{k}{55}$

$4(55) = k$

$220 = k$

$t = \frac{220}{45}$

$t = 4.88888889$

$t = 4.9$

2. The length L of a pendulum varies directly as the square of its period T . Express L as a function of T . Solve for the value of the constant k when $L = 1.0$ m and $T = 2.0$ sec. Find the value length of the pendulum when $T = 4.0$ sec.

$L = kT^2$

$1.0 = k(2.0)^2$

$\frac{1.0}{4} = \frac{4k}{4}$

$\frac{1}{4} = k$

$L = \frac{1}{4}(4.0 \text{ sec})^2$

$L = \frac{1}{4}(16 \text{ sec}^2)$

$L = 4 \text{ m}$

3. The electrical resistance R of a wire varies directly as the length L of the wire. Express R as a function of L , if $R = 1.5 \Omega$ when $L = 75$ m. Find the resistance of a similar wire whose length is 80 m.

$R = kL$

$1.5 = \frac{k}{75}$

$1.5(75) = k$

$112.5 = k$

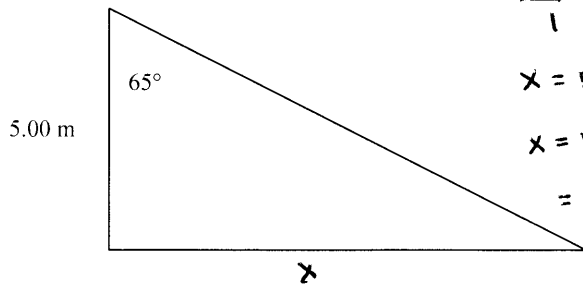
$R = \frac{112.5}{80}$

$R = 1.40625$

$= 1.4 \Omega$

Resolve the Following: Use an Acceptable Technique. All answers need to be in proper significant digits.

4. Find the area for the right triangle.



$$\tan 65 = \frac{x}{5.00}$$

$$x = 5.00 \tan 65$$

$$x = 10.7225346$$

$$= 10.7$$

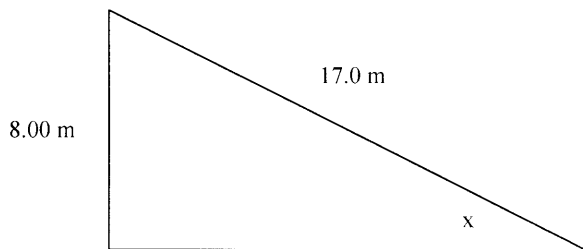
4. 26.8 m²

$$A = \frac{1}{2} (10.7)(5.00)$$

$$= 26.75 \text{ m}^2$$

$$= 26.8 \text{ m}^2$$

5. Find the measure of the indicated angle.



$$\sin x = \frac{8.00}{17.0}$$

$$\sin^{-1}(8/17)$$

$$x = 28^\circ \text{ (Nearest Degree)}$$

5. 28°

6. Given $\triangle ABC \sim \triangle AEF$, and that $\overline{AD} = 8.00$, $\overline{DB} = 4.00$, $\overline{AC} = 18.00$, and $\overline{DE} = 6.00$. $\angle A = 65^\circ$, $\angle ABC = 75^\circ$, find x and y.

1. Find x

$$\frac{8}{6} = \frac{12}{x}$$

$$72 = 6x$$

$$12 = x$$

$$9.00 \text{ m} = x$$

2. Find y

$$\frac{8}{12} = \frac{y}{18}$$

$$12y = 144$$

$$y = 12$$

$$y = 12.0 \text{ m}$$

