Math 65 – Weekly Activity 1 (50 points) **Name:** _____

Simplify the following expressions. Make sure to use the " = " symbol appropriately. Due _____

(1) **(a)** -2^4 **(b)** $(-2)^4$

(2) $28 + 5 \cdot 2^3 - 6$ **(3)** $\left(\frac{1}{2}+\frac{2}{5}\right)\div\frac{3}{5}$

Evaluate the expressions when x = -3 and y = 2:

(4) $3x^2 - 4y + 2$ **(5)** $\frac{x+5}{3y+4}$

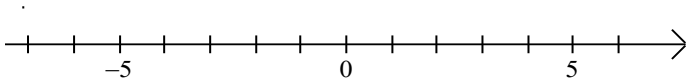
Solve for x:

(6) $3x - 8 = 2(x + 7)$ **(7)** $\frac{x}{2} - \frac{1}{6} = \frac{5}{3}$

(8) $0.5x + 6 = 2.5x - 16$ **(9)** Show how to check your answer for problem (8).

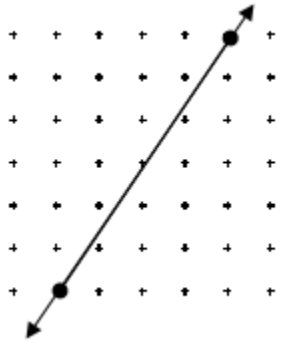
(10) Solve the inequality, and graph the solution on the number line.

$$4 + 3x < x + 12$$

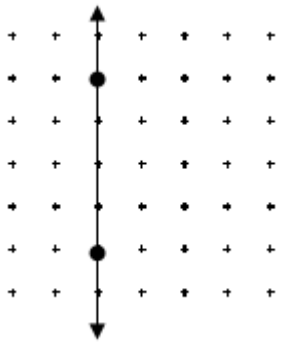


Find the slopes of the lines between each of the following pairs of points:
(reduce fractions, assume that each square stands for one unit.)

(11)



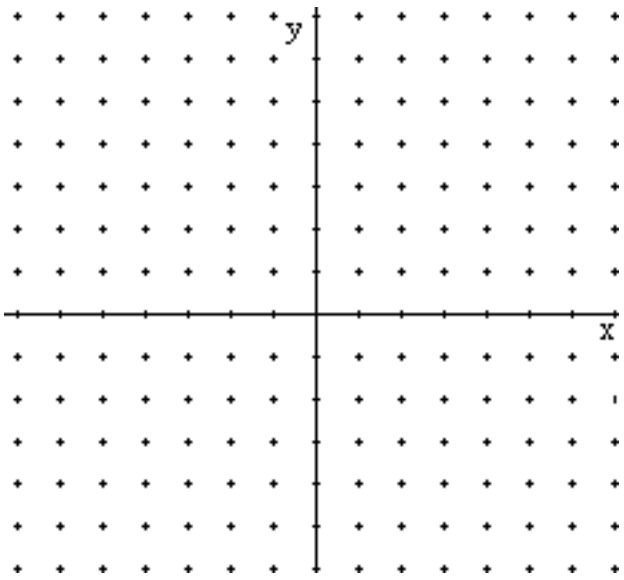
(12)



Recall: *slope* = $\frac{rise}{run}$

(13) Graph **y = 3x – 1** on the graph below.

(14) Graph **x = -4** on the same graph.



Math 65 – Weekly Activity 2 (50 points) **Name:** _____

Make sure to use the " = " symbol appropriately. No "=" *between* equations. Due _____

Neatly solve each equation, lining up the "="s" down the page... and check your answer in original equation:

(1) $2x-12+3(x-3)=5+x+2(x-6)$

(2)

(3) $\frac{x+1}{4}=\frac{x}{5}$

(4)

(5) $\frac{x}{4}+\frac{1}{3}-\frac{x}{6}=\frac{1}{2}-\frac{x}{6}+\frac{1}{3}$

(6)

Find each fractions answer, <u>showing your work</u> and appropriate use of the equal sign:

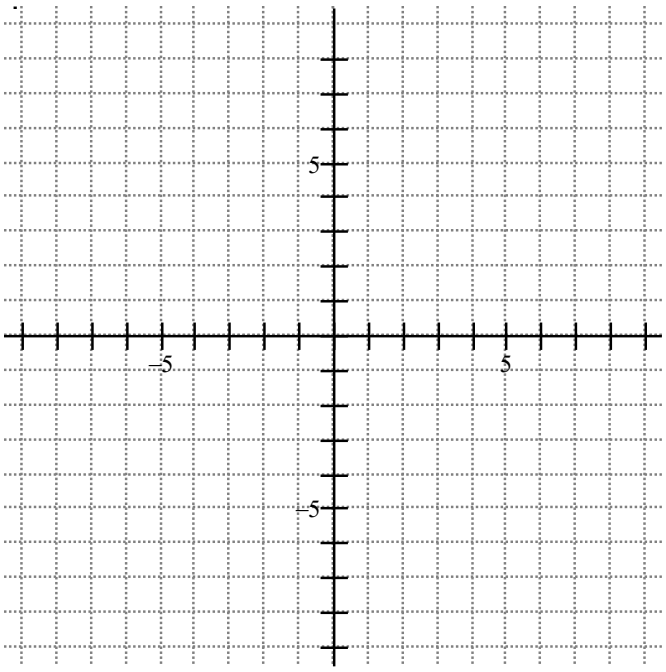
(7) $\left(\frac{1}{2}+\frac{2}{3}\right)\div\left(\frac{4}{9}-\frac{1}{2}\right)$

(8) $\frac{2}{3}\cdot\frac{9}{5}-\frac{7}{2}\div\frac{10}{3}$

For the following: i) fill in the T-table, ii) plot each point, iii) draw the line using a straight edge so that it passes through the entire coordinate system given, iv) include arrows on each "end" of the line, v) identify the *x*-intercept and *y*-intercept using ordered pairs.

(9) $y=-3x+5$

x	y
-2	
-1	
0	
1	
2	
3	
4	



slope =

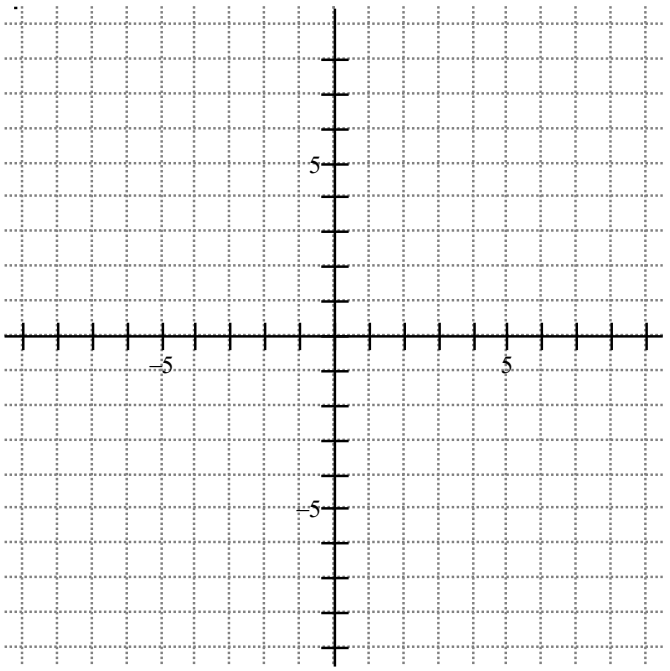
x-intercept:

y-intercept:

(10) Graph both of the following equations on the included coordinate plane:

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

slope =	slope =
x-intercept:	*x*-intercept:
y-intercept:	*y*-intercept:



Solve the following system of equations using the substitution method or the elimination method: Express the solution as an ordered pair.

$$\begin{cases} y = 2x + 1 \\ y = \frac{1}{2}x - 2 \end{cases}$$

How does the solution to the system appear on a graph?

(11) Consider the following problem:

> Daniel buys last year's best-selling novel, in hardcover, for $16.80. This is with a 30% discount from the original price. What was the original price of the novel?

a) What quantity are you trying to find? Describe in words and label it "*x*":

b) Set up an equation that represents the situation given. Solve your equation. What did you get for *x*?

c) Use a sentence to answer the original question:

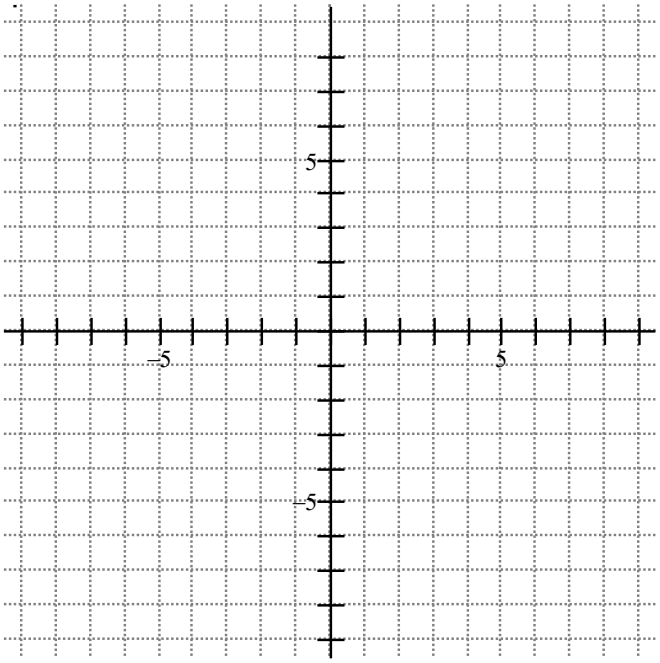
Math 65 – Weekly Activity 3 (50 points) Name: _____

Make sure to use the " = " symbol appropriately. No "=" *between* equations. Due _____

Graphing from the equation: fill in the t-table, plot the points, and then graph the line or curve. Graph the points exactly, and use a <u>ruler</u> to draw all straight lines so that they pass through the entire coordinate system given, with arrows. Identify the *x*-intercept and *y*-intercept using ordered pairs.

(1) $y = 2x - 5$

x	y
-3	
-2	
-1	
0	
1	
2	
3	



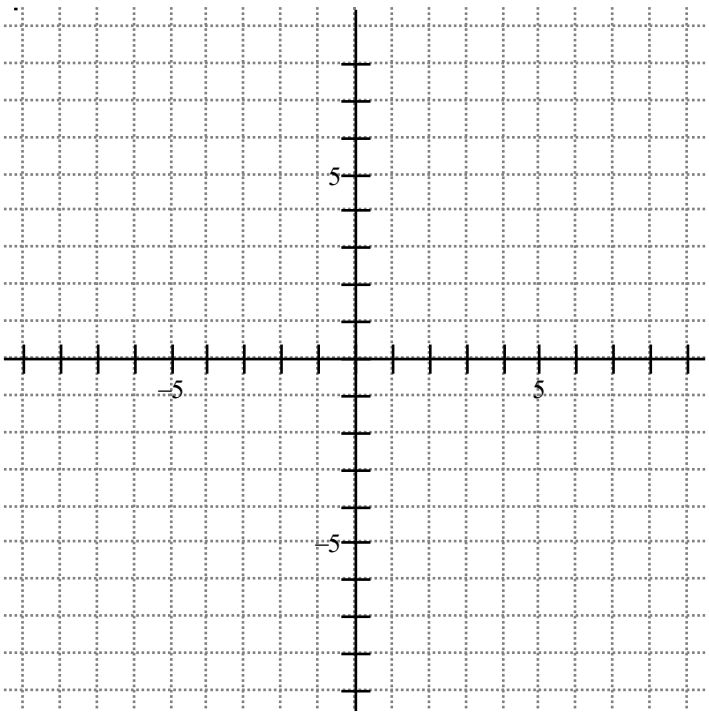
slope = *x*-intercept:

y-intercept:

Recall: *slope* = $\frac{rise}{run}$

(2) $y = -\frac{1}{3}x + 4$

x	y
-6	
-3	
0	
3	
6	
9	



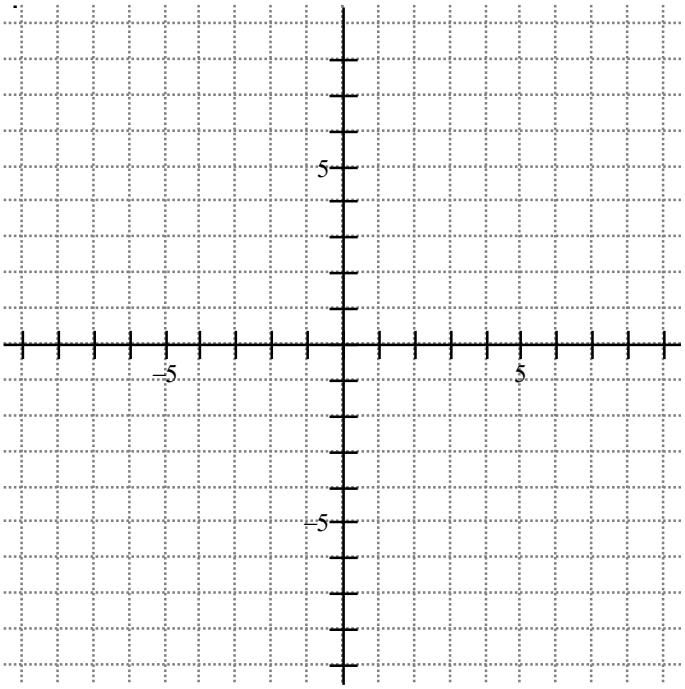
slope = *x*-intercept:

y-intercept:

Graph the following on the same coordinate system:

(3) $y = 5$

x	y
-3	
-2	
-1	
0	
1	
2	
3	



(4) $x = 2$

x	y

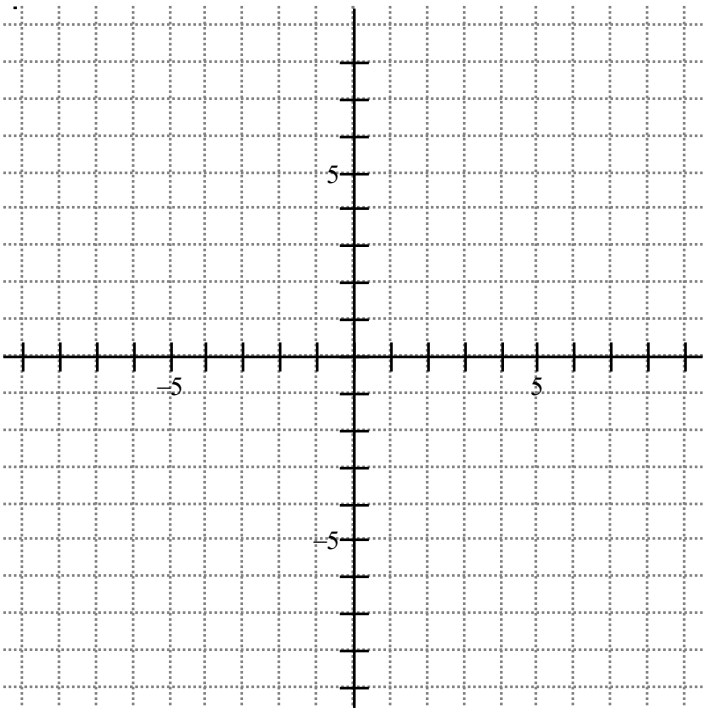
slope = *x*-intercept: *y*-intercept:

slope = *x*-intercept: *y*-intercept:

Recall: *slope* = $\frac{rise}{run}$

(5) Graph each of the following equations:
(Hint: Solve each of the equations for y so you can graph each equation using the slope-intercept form)

$$\begin{cases} 4x - y = -9 \\ 2x + y = -3 \end{cases}$$



Use the graphs to determine the solution of the system as an ordered pair. (Hint: where do the graphs intersect each other?)

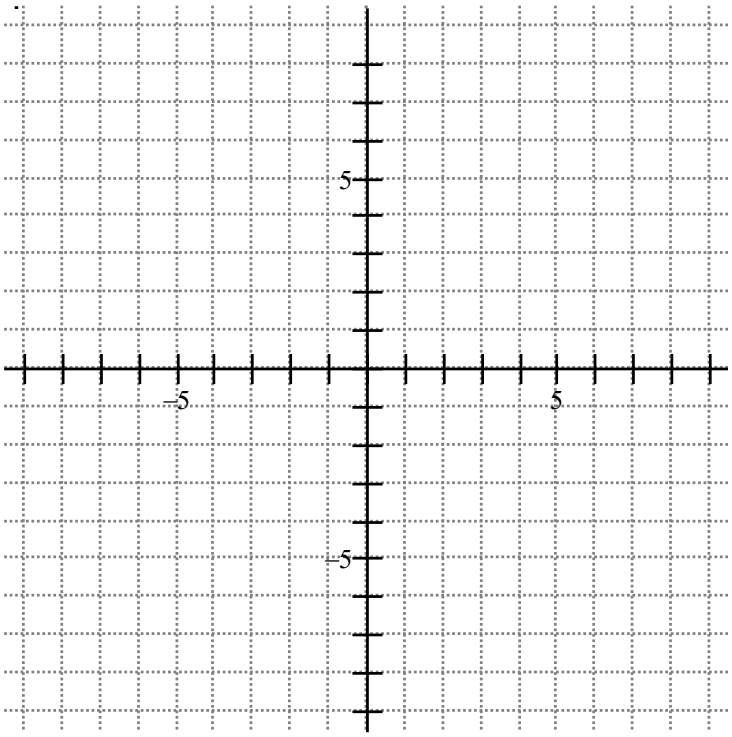
$$\begin{cases} 4x - y = -9 \\ 2x + y = -3 \end{cases}$$

Solution:_____

For the following: fill in the table, plot each point and carefully draw the smooth curve that passes through each point so that it passes through the entire coordinate system given, with arrows on the ends. Note the shape! It is called a **parabola.** Parabolas don't have a slope like a line does. Where is the lowest point for **(6)**? That point is called the **vertex**.

(6) $y = x^2$

x	y
-3	
-2	
-1	
0	
1	
2	
3	



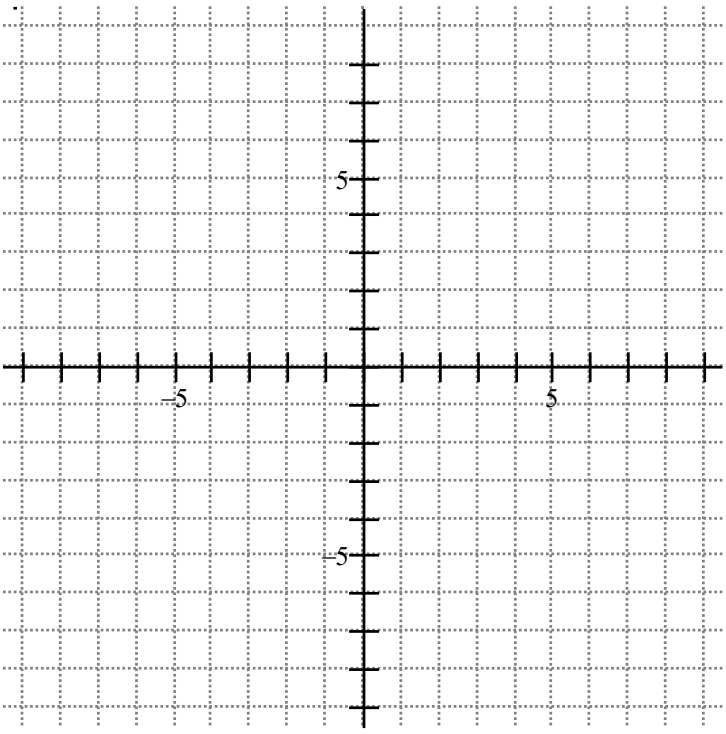
x-intercept(s):

vertex:

y-intercept:

(7) $y = -x^2$

x	y
-3	
-2	
-1	
0	
1	
2	
3	



How is the graph in (7) different from (6)?

Where do you think the vertex is now?

x-intercept(s):

vertex:

y-intercept:

(8) Simplify: $\left(\frac{1}{2}-\frac{1}{3}\right)^2+\frac{4}{9}\div\frac{6}{5}$ (You might *eventually* need 108 as a common denominator)

(9) Solve: $\frac{x+5}{3}-x=\frac{-5x}{10}$

(10) Simplify (the final expression must not contain any negative exponents):

(a) $3(2^{-3}x^4)^3$

(b) $(-3xy^2)(-5x^2y^{-5})^2$

Write the equation of each line in Slope-Intercept form

(11) passing through the point $(-3,6)$ with slope $m = ½$

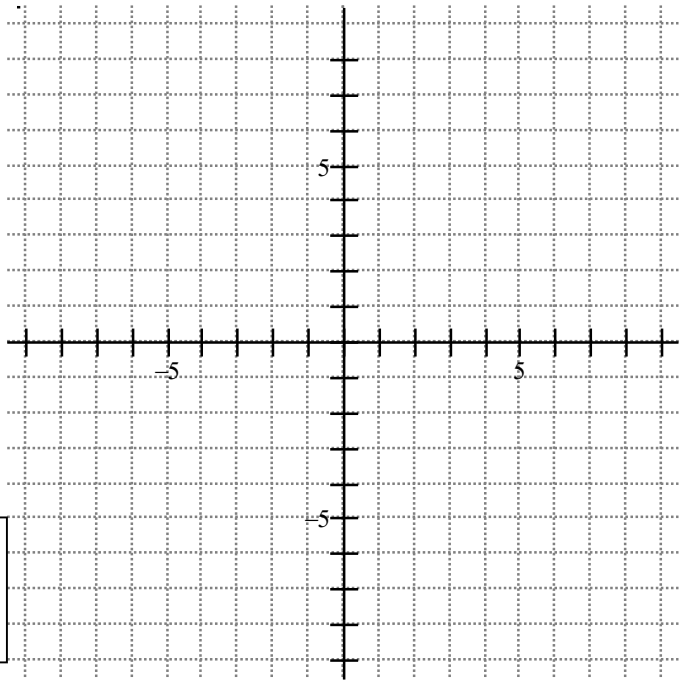
(12) a line passing through the points $(-2, 6)$ and $(3, 1)$

Math 65 – Weekly Activity 4 (50 points) **Name:** _____

Make sure to use the " = " symbol appropriately. No "=" *between* equations. Due _____

Graphing from the equation: build your own T-table, if necessary, then graph the line or curve. Remember to show graph over the entire coordinate system and arrows on the end.

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



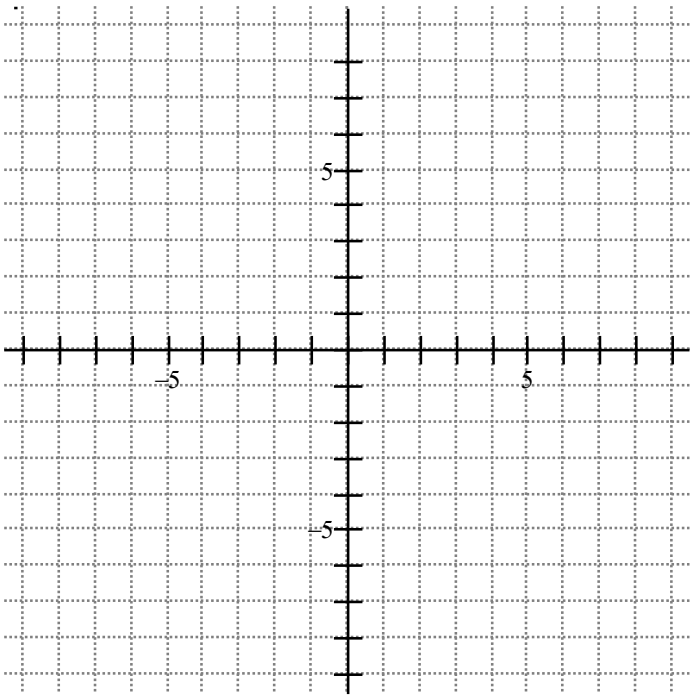
slope =

x-intercept:

y-intercept:

(2) Graph $y = -3$ and $x = 5$ on the same graph. Label each with its correct slope.

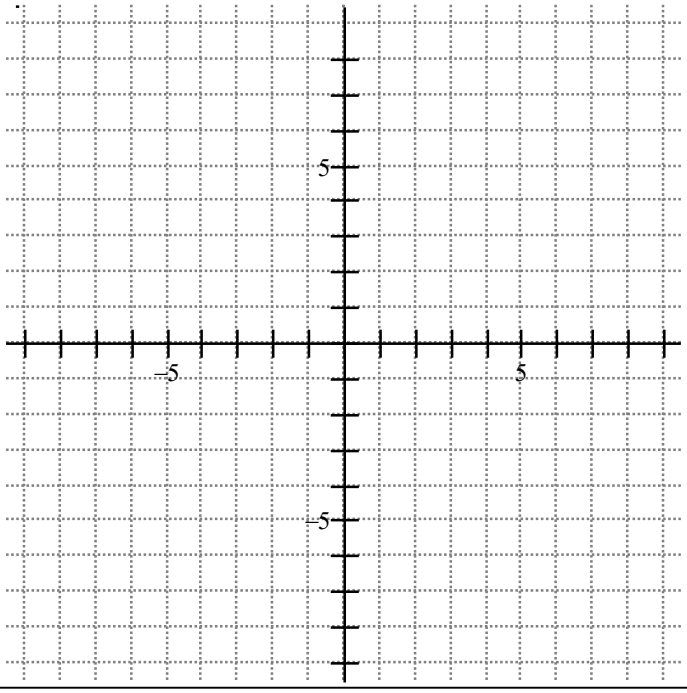
State the intersection of the two lines as an ordered pair:



Use the given form of the equations to find the associated *y* value for each of the given *x*'s.

(3) $y = (x-2)(x+2)$

x	y
-3	
-2	
-1	
0	
1	
2	
3	



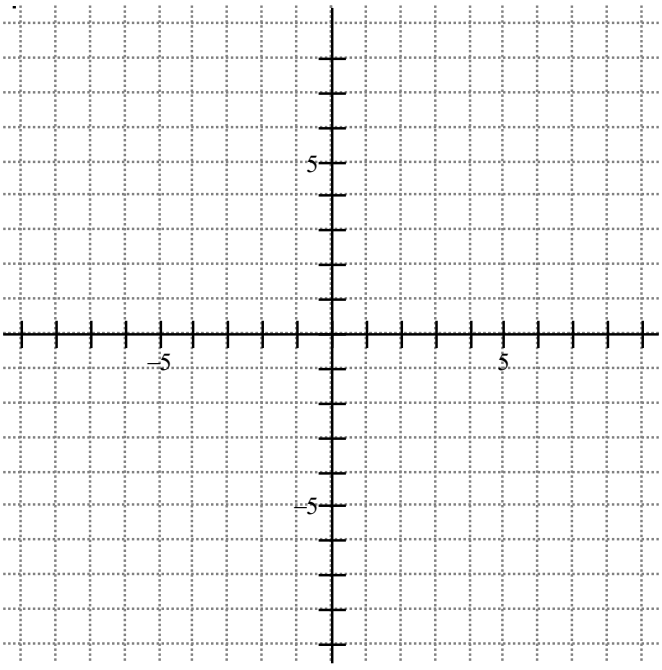
x-intercept(s):

vertex:

y-intercept:

(4) $y = x^2 - 4$

x	y
-3	
-2	
-1	
0	
1	
2	
3	



x-intercept(s):

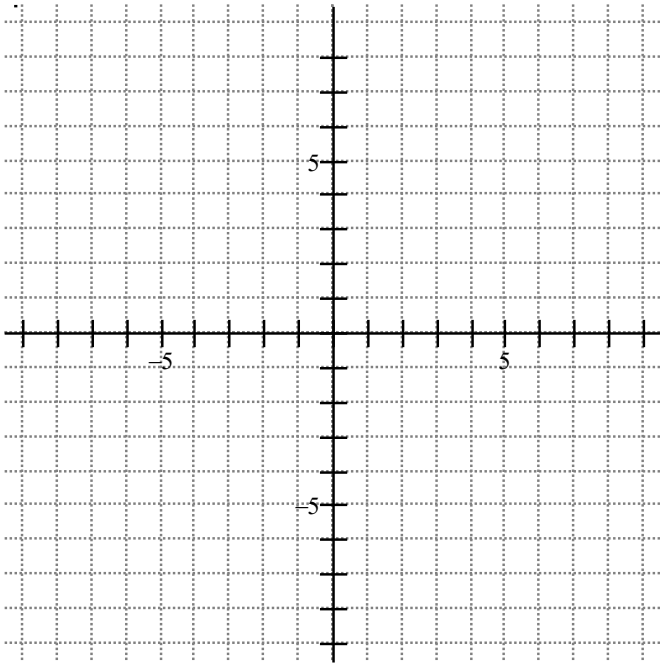
vertex:

y-intercept:

What do the graphs have in common? Why?

(5) $y = (x+4)(x-2)$

x	y
-5	
-4	
-3	
-2	
-1	
0	
1	
2	



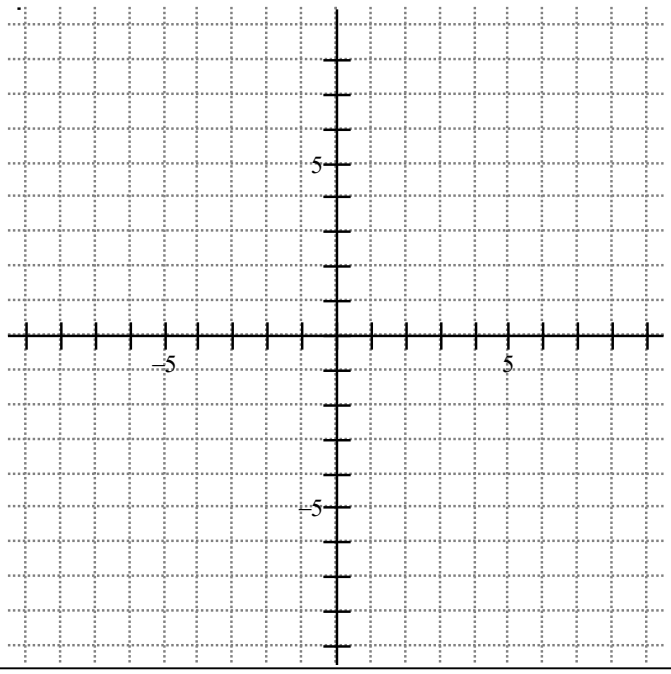
x-intercept(s):

vertex:

y-intercept:

(6) $y = x^2 + 2x - 8$

x	y
-5	
-4	
-3	
-2	
-1	
0	
1	
2	



x-intercept(s):

vertex:

y-intercept:

What do the graphs have in common? Why?

Where appropriate, *simplify* the <u>expression</u> OR *solve* the <u>equation</u>:

(7) $\left(\frac{2}{3}+\frac{1}{4}\right)^2-\left(\frac{7}{12}\right)^2+\frac{1}{4}\div\frac{3}{5}$

(8) $\frac{x}{2}+\frac{3}{8}=\frac{5x}{8}-\frac{1}{2}$

Solve the following systems, show work:

(9) $\begin{cases}3x - y = 7\\ x + y = 5\end{cases}$

(10) $\begin{cases}4x + 3y = 2\\ 3x + 2y = 3\end{cases}$

Simplify (the final expression must not contain any negative exponents):

(11) $(3a^2b^4)(4^{-2}a^5b^{-3})^3$

(12) $\frac{(5x^2y^3)(3x^{-3}y^4)^3}{(25x^{-4}y)(6y^{-2})}$

Math 65 – Weekly Activity 5 (50 points) **Name:** _____

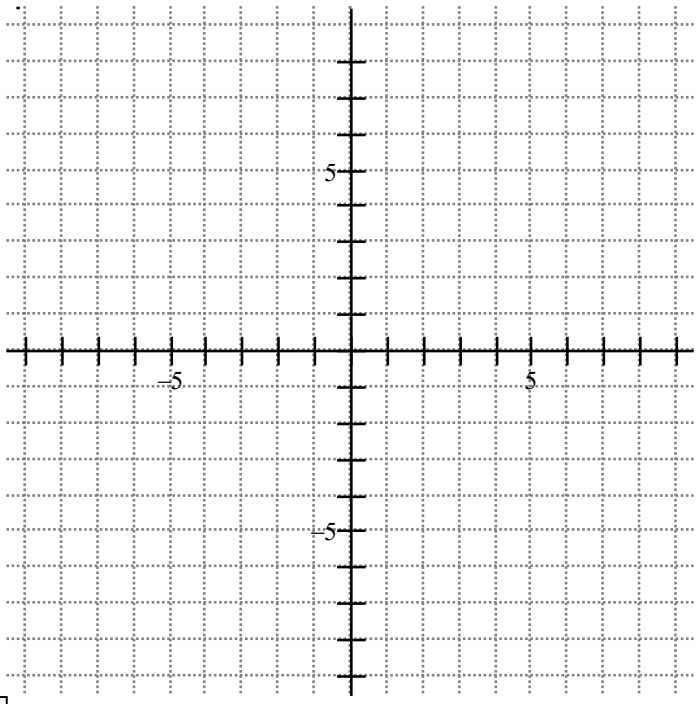
Make sure to use the " = " symbol appropriately. No "=" *between* equations. Due _____

Graphing from the equation: build your own T-table, if necessary, then graph the line or curve. Remember to show graph over the entire coordinate system and arrows on the end.

You will have to estimate the x-intercepts for the following two graphs.

(1) $y = x^2 + 2x - 5$

x	y



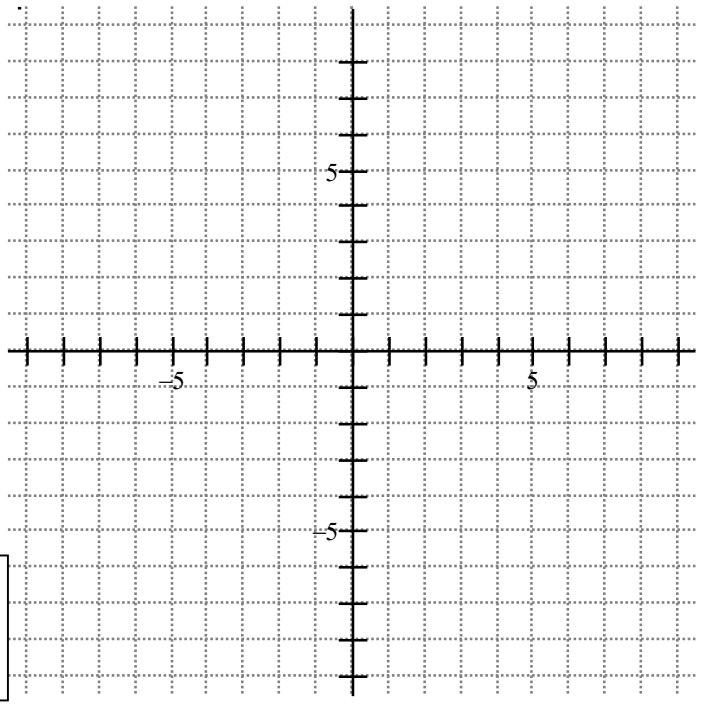
vertex:

x-intercept(s):

y-intercept:

(2) $y = -x^2 + 7$

x	y

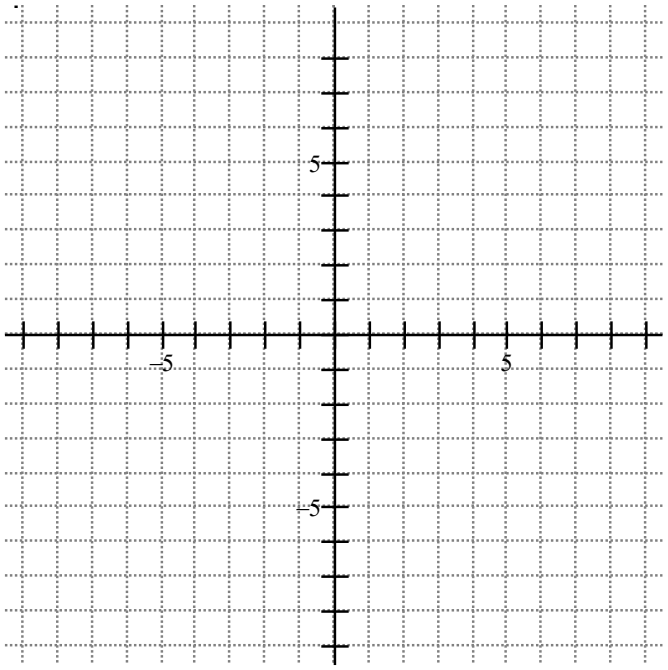


vertex:

x-intercept(s):

y-intercept:

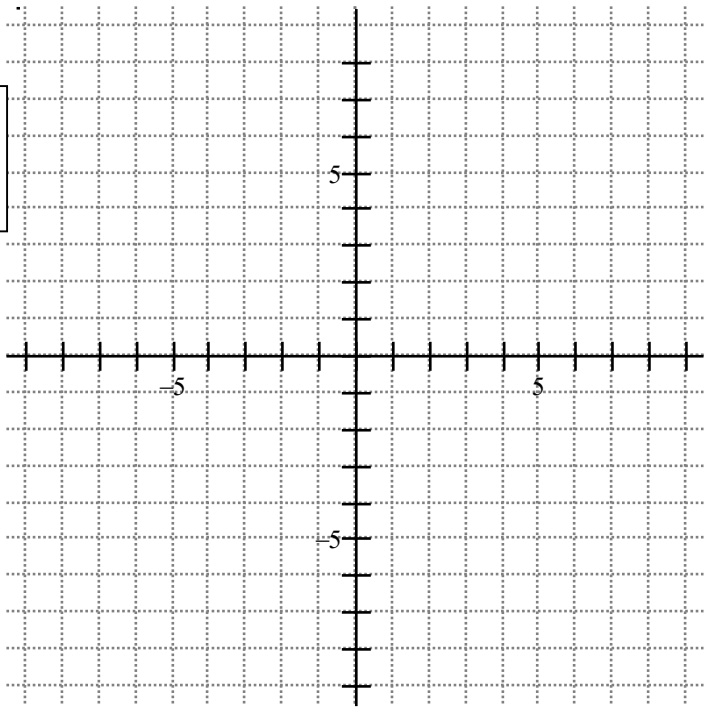
(3) $y = \frac{3}{2}x - 3$



slope =	*x*-intercept: *y*-intercept:

(4) $y = (x + 6)(x)$

vertex:	*x*-intercept(s): *y*-intercept:



(5) Graph the line $y = 2x + 5$ on the same graph:

At what points (as ordered pairs) does the **line** intersect the **parabola**?

Where appropriate, *simplify* the <u>expression</u> OR *solve* the <u>equation</u>, showing work and proper use of the equal sign, neatly please.

(6) $\left(\frac{2}{5}\cdot\frac{1}{4}\right)^2+\left(\frac{3}{5}\right)^2+\left(\frac{3}{2}\right)\div\left(\frac{10}{7}\right)$

(7) $\frac{3x}{4}+\frac{x}{5}=\frac{x}{2}-\frac{3}{10}$

(8) $x(x^2+3x+2)+2(x^2-3x+2)$

(9) $-2x^4(x^3-x^2+4x)$

(10) $(3x^2+7x-6)-(x^2-2x+5)$

Solve the following systems of equations using the substitution or elimination (addition) method:

(11) $\begin{cases} \frac{1}{2}x - \frac{1}{2}y = 1 \\ \frac{1}{4}x + \frac{1}{2}y = 2 \end{cases}$

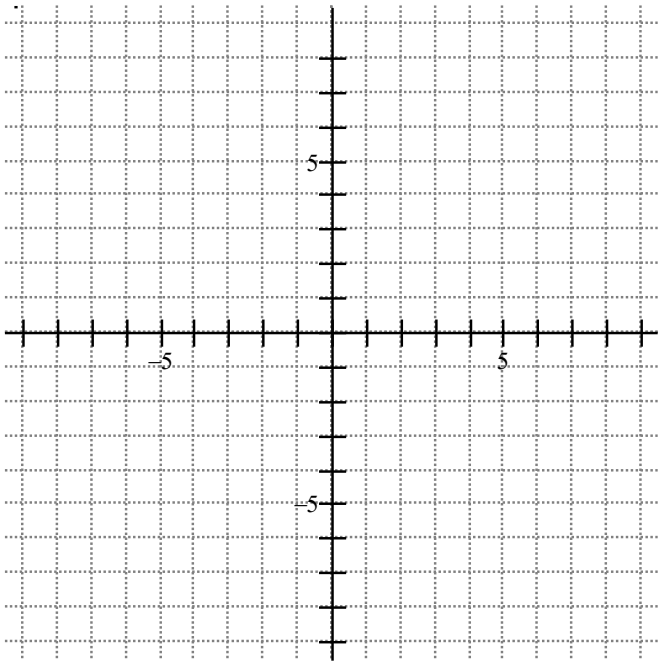
(12) $\begin{cases} 20x - 8y = 40 \\ -15x + 6y = 30 \end{cases}$

Math 65 – Weekly Activity 6 (50 points) Name: _____
Make sure to use the " = " symbol appropriately. No "=" *between* equations. Due _____

Graphing from the equation: build your own T-table, if necessary, then graph the line or curve. Remember to show graph over the entire coordinate system and arrows on the end.
You may have to estimate the x-intercepts for some of the following graphs.

Factor the right hand side of the following two equations, if possible.

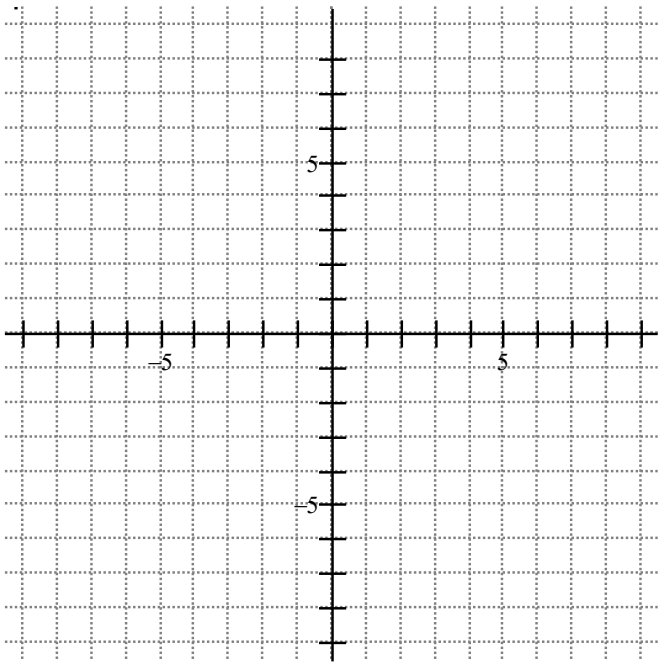
(1) $y = x^2 - 4x + 1$



vertex:	*x*-intercept(s):
	y-intercept:

Is the graph in (1) a parabola or a line?_____ Why? How can you tell from the equation?_____

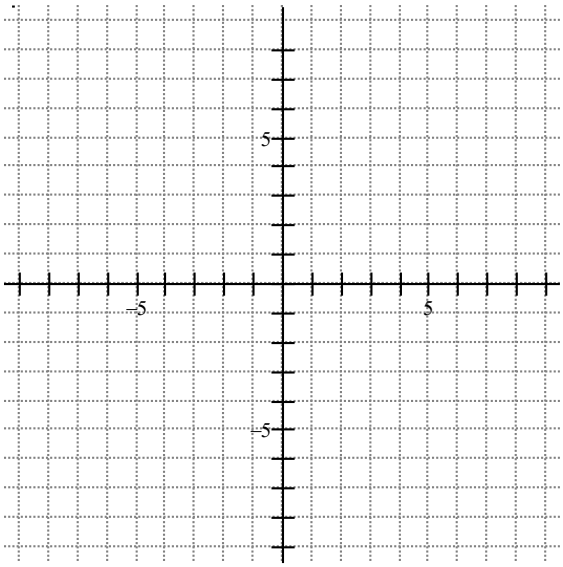
(2) $y = -x^2 + 2x + 3$



vertex:	*x*-intercept(s):
	y-intercept:

Is the graph in (2) a parabola or a line?_____ Why? How can you tell from the equation?_____

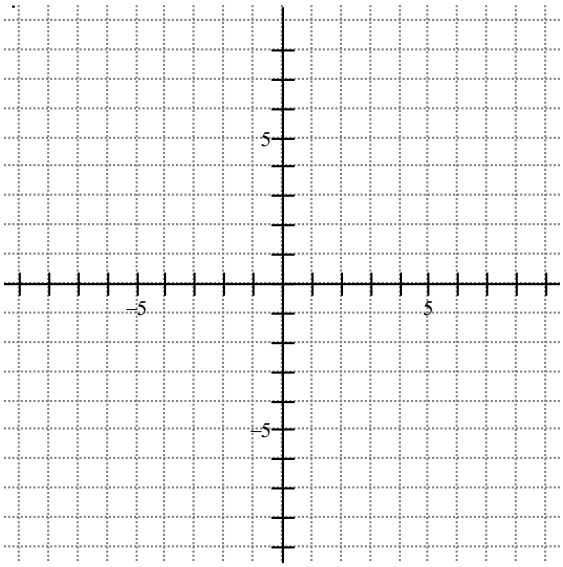
(3) $y = \frac{-1}{3}x + 2$



slope =	*x*-intercept: *y*-intercept:

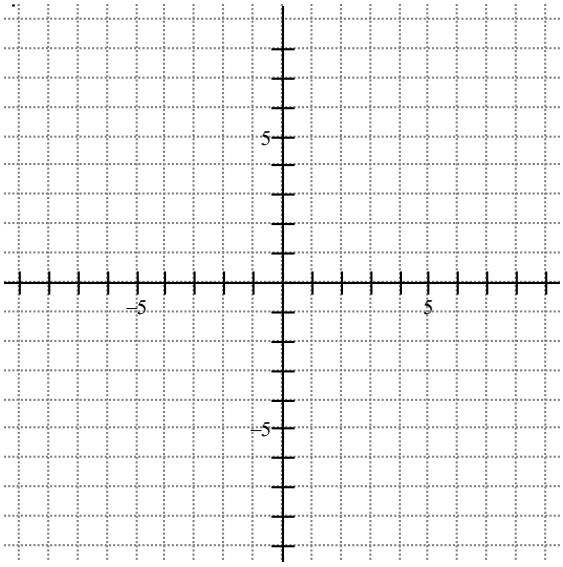
Is the graph in (3) a parabola or a line?_____ Why? How can you tell from the equation?_____

(4) $y = (x-2)(x+4)$



vertex:	*x*-intercept(s): *y*-intercept:

Is the graph in (4) a parabola or a line?_____ Why? How can you tell from the equation?_____



(5) Graph $y = 4$. Label it with its correct slope.

(6) Graph $x = -6$. Label it with its correct slope.

Where appropriate, *simplify* the <u>expression</u> OR *solve* the <u>equation</u>:

(7) $$\frac{2}{5} \div \frac{10}{7} + \left(\frac{1}{3} - \frac{3}{4}\right) + \left(\frac{5}{6}\right)^2$$

(8) $$\frac{4x+6}{3} + \frac{x}{2} = \frac{3x+28}{6} + \frac{10}{3}$$

(9) First, make sure each number in the fraction is written in scientific notation (show work by writing this step). Then, perform the indicated operations (without a calculator), and write your answer in scientific notation:

$$\frac{4300 \quad 3.0\times10^{2}}{1.5\times10^{-3} \quad 0.00086}$$

(10) Given $p(x)=x^{2}+14x-3$

Find $p(-2)$

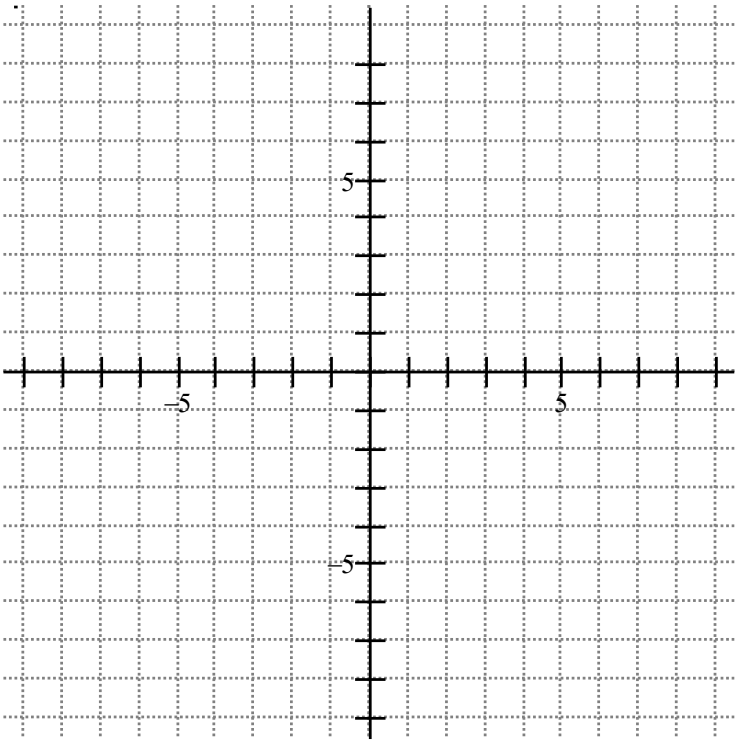
Find $p(a-1)$

Math 65 – Weekly Activity 7 (50 points) **Name:** _____

Make sure to use the " = " symbol appropriately. No "=" *between* equations. Due _____

Graphing from the equation: build your own T-table, where necessary, then graph the line or curve. Remember to show graph over the entire coordinate system and arrows on the end.

(1) a) $y = x^2 - 6x + 5$



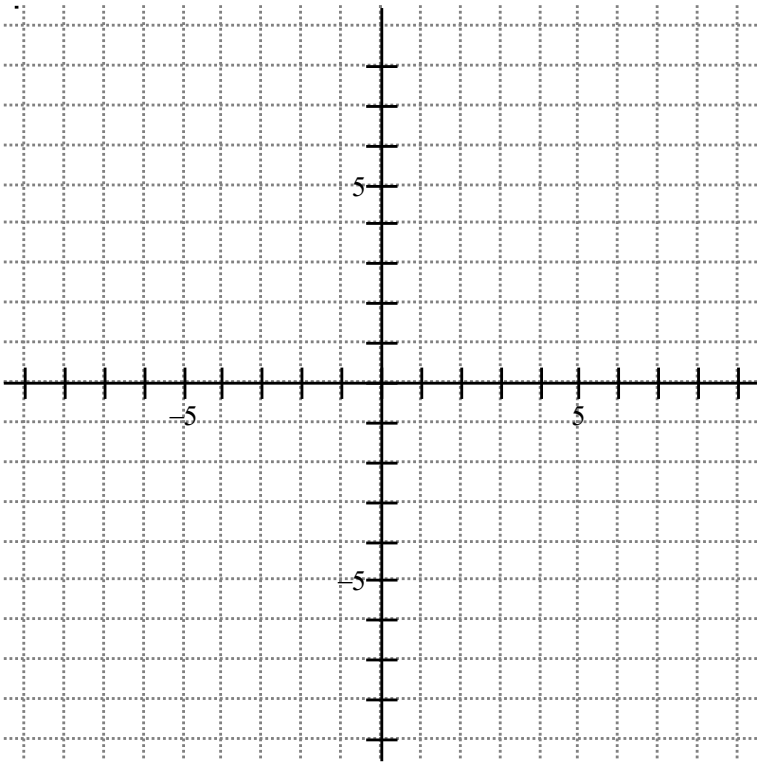
vertex:	*x*-intercept(s):
	y-intercept:

b) Now, solve the equation by factoring:

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

c) How do the solutions to your equation in b) appear on the graph above?

(2) a) $y = 2x - 8$



Fill in the box that applies for this graph:

vertex:	*x*-intercept(s): *y*-intercept:

slope =	*x*-intercept: *y*-intercept:

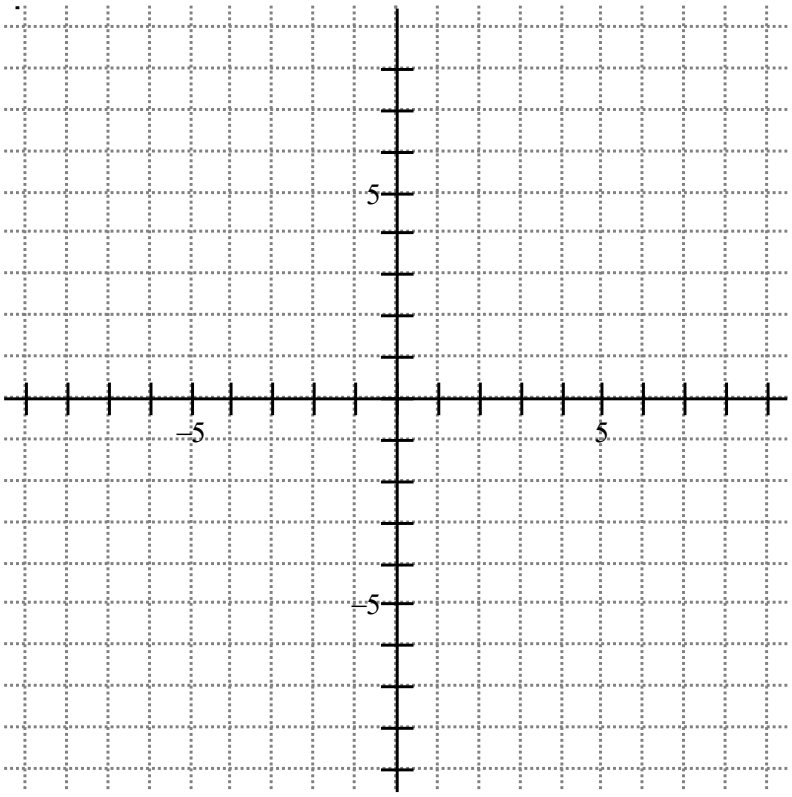
b) Now, solve the equation:

$$2x - 8 = 0$$

c) How do the solutions to your equation in b) appear on the graph above?

(3) a) $y = x^3 - 2x^2 - 3x$

x	y
-2	
-1	
0	
1	
2	
3	
4	



b) Now, solve the equation by factoring:

$$x^3 - 2x^2 - 3x = 0$$

c) How do the solutions to your equation in b) appear on the graph above?

(4) Rewrite each fraction in its simplest form; use the equal sign appropriately. If necessary, identify any restrictions for each expression

$$\frac{42}{12}$$

$$\frac{25x^2}{15x}$$

Hint: for the following, factor the numerator and the denominator, use parenthesis correctly:

$$\frac{x^2-13x+30}{x^2-100}$$

(5) Solve the equation:

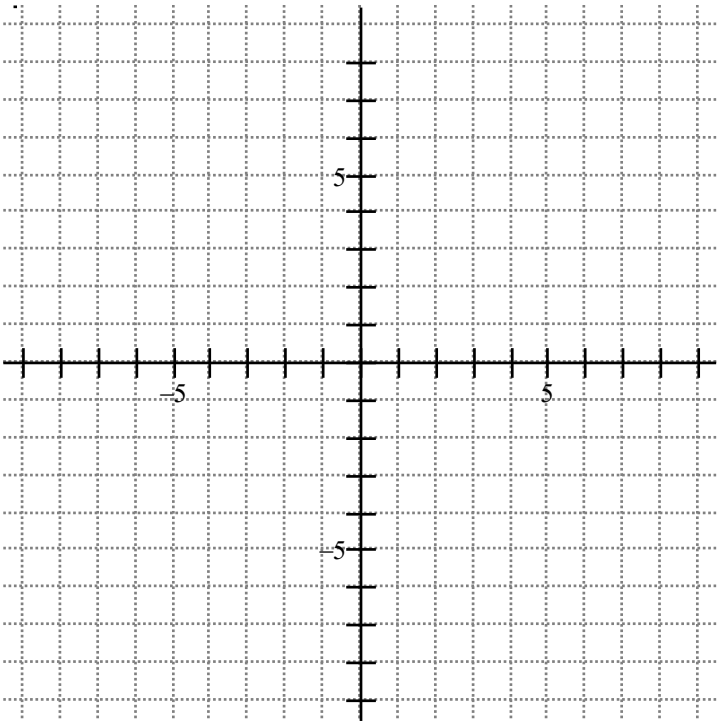
$$\frac{x}{5}=7+\frac{3x}{10}$$

Math 65 – Weekly Activity 8 (50 points) Name: _____

Make sure to use the " = " symbol appropriately. No "=" *between* equations. Due _____

Graphing from the equation: build your own T-table, if necessary, then graph the line or curve. Remember to show graph over the entire coordinate system and arrows on the end.

(1) a) $y = -x^2 + 2x + 8$



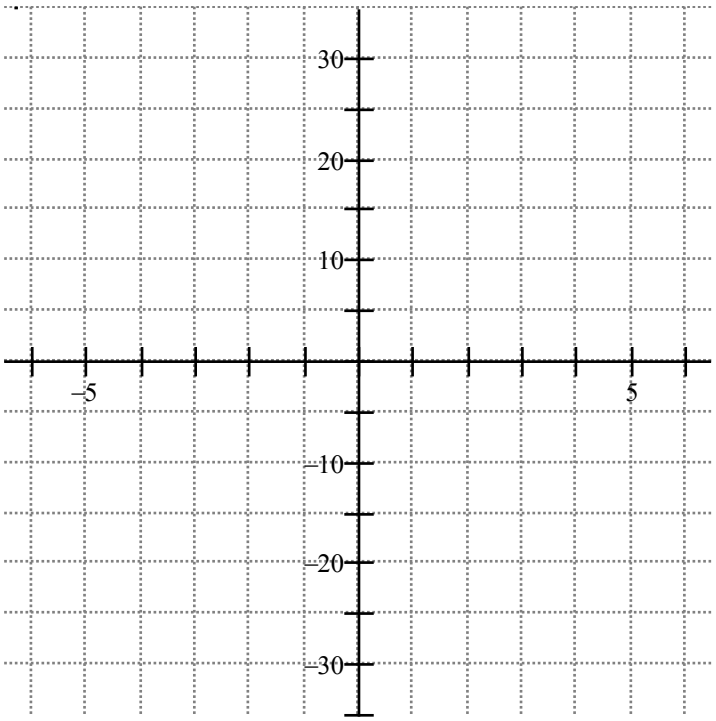
vertex:	*x*-intercept(s):
	y-intercept:

b) Now, solve the equation by factoring:

$$-x^2 + 2x + 8 = 0$$

c) How do the solutions to your equation in b) appear on the graph above?

(2) a) $y = x^3 - 9x$



b) How is this graph different from the previous in (1)?

x-intercept(s):	*y*-intercept:

c) Now, solve the equation by factoring:

$$x^3 - 9x = 0$$

d) How do the solutions to your equation in c) appear on the graph above?

Solve each of the following equations by factoring:

(1) $x^2 - 14x + 40 = 0$

(2) $x^2 + 5x + 4 = 0$

(3) $x^2 - 7x - 8 = 0$

(4) $x^3 - 3x^2 - 28x = 0$

(5) One positive integer is 6 more than another. Their product is 91. Find the integers.

a) Identify your variable:

b) Set up and solve an equation that you can derive from the problem:

c) Use a sentence to answer the original question:

(6) The height of a triangle is 3 centimeters less than the base. The area of the triangle is 9 square centimeters. Find the length of the base and the height of the triangle.

a) Identify your variable, in this case draw and label a picture that represents the situation:

b) Set up and solve an equation that you can derive from the problem:

c) Use a sentence to answer the original question:

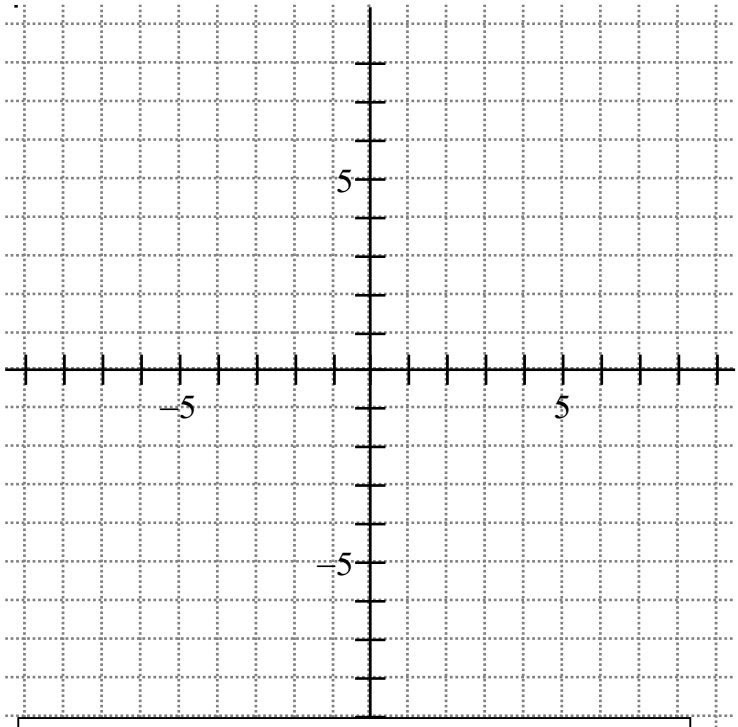
Math 65 – Weekly Activity 9 (50 points) **Name:** _____
Make sure to use the " = " symbol appropriately. No "=" *between* equations. Due _____

Graphing from the equation: build your own T-table, if necessary, then graph the line or curve. Remember to show graph over the entire coordinate system and arrows on the end.

Practice graphing lines from the equation: graph the line, using the y-intercept and then slope.

(1) Graph $y = -3x + 5$

(2) Choose one of the points on your graph and check it in the equation. Specify what point you're checking. It should not be the y-intercept. It should be on the line and satisfy the equation.



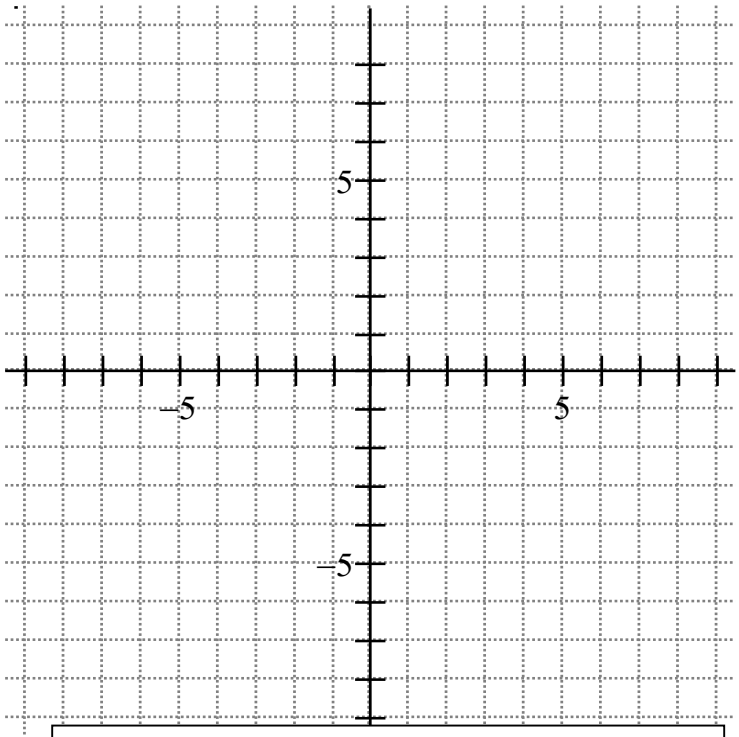
slope =

x-intercept:

y-intercept:

(3) Graph $y = \frac{1}{4}x - 2$

(4) Choose one of the points on your graph and check it in the equation. Specify what point you're checking. It should not be the y-intercept. It should be on the line and satisfy the equation



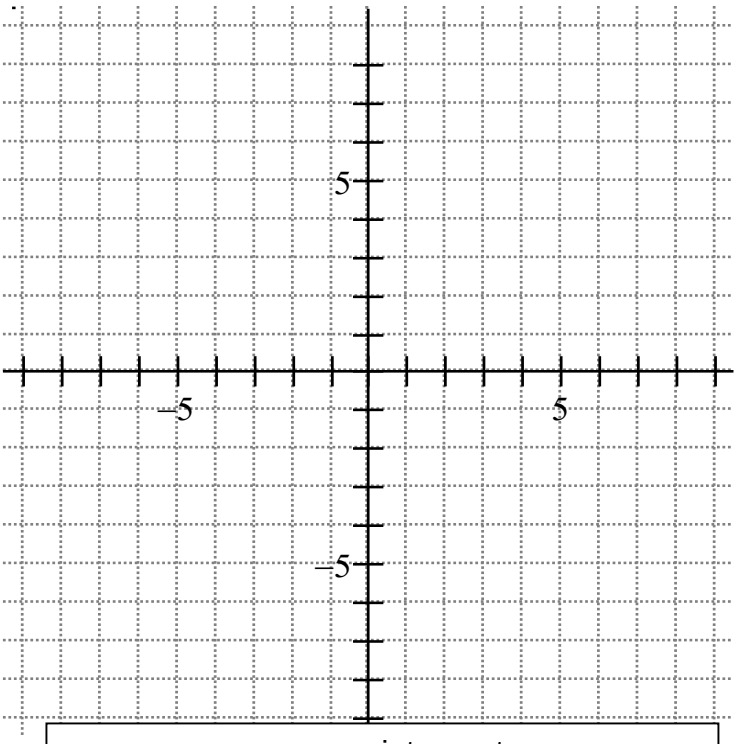
slope =

x-intercept:

y-intercept:

(5) Graph $y = 2x - 3$

(6) Choose one of the points on your graph and check it in the equation. Specify what point you're checking. It should not be the y-intercept. It should be on the line and satisfy the equation



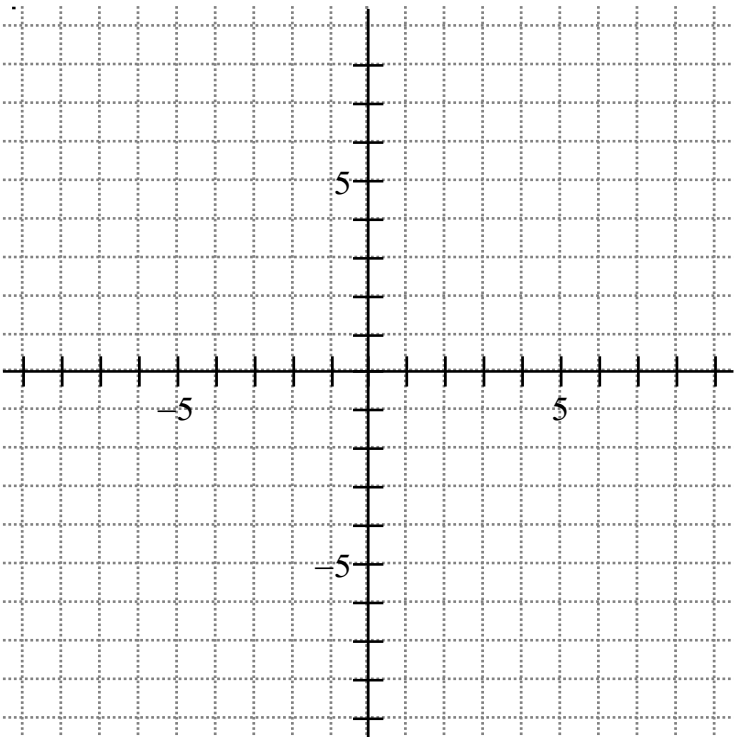
slope =

x-intercept:

y-intercept:

(7) Graph $y = -\frac{3}{2}x$

(8) Choose one of the points on your graph and check it in the equation. Specify what point you're checking. It should not be the y-intercept. It should be on the line and satisfy the equation



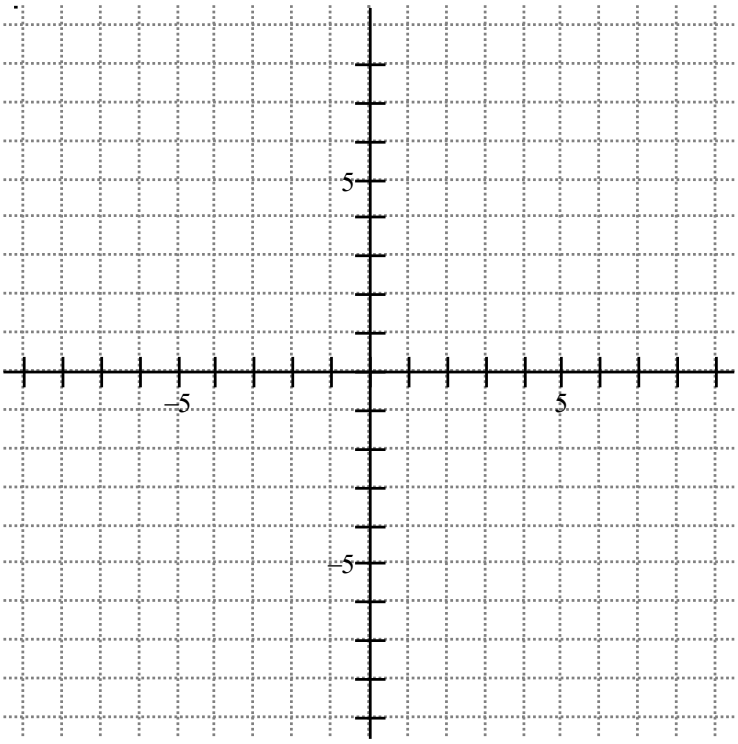
slope =

x-intercept:

y-intercept:

Graphing from the equation: build your own T-table, if necessary, then graph the line or curve. Remember to show graph over the entire coordinate system and arrows on the end.

(9) a) $y = x^2 - 6x + 11$



vertex:	*x*-intercept(s):
	y-intercept:

b) Now, solve the equation by using the *quadratic formula*:

$$x^2 - 6x + 11 = 0$$

c) How do the solutions to your equation in b) appear on the graph above? Explain.

(10) Simplify (the final expression must not contain any negative exponents):

a) $\dfrac{\left(3x^{2}y^{-1}\right)^{-2}}{\left(6x^{-1}y\right)^{-3}}$

b) $\dfrac{36a^{-5}b^{0}}{-9a^{5}b^{-3}}$

(11) Given $p(x)=x^{2}-6x+11$

Find $p(-2)$

Find $p(a-2)$

(12) Where appropriate, *simplify* the <u>expression</u> OR *solve* the <u>equation</u>:

a) $\sqrt{128x^{6}y^{9}}$

b) $\sqrt{3x+13}+3=2x$

Math 65 – BONUS (!) Weekly Activity Ch. 7 (50 points) Name: _____

Make sure to use the " = " symbol appropriately. Due _____

Simplify the following rational expressions. To get full credit your work must be IN PENCIL, neat, and correct notation. Also, make sure to show all necessary work. To that end, I'd recommend you work some of these out on scratch paper first and copy your work neatly to this paper.

1) $\frac{12x}{6x^2}$

2) $\frac{81x^3}{18x}$

3) $\frac{5y^2}{10y + y^2}$

4) $\frac{x - 2}{x^2 - 4}$

5) $\frac{2x^3 - x^2 - 6x}{2x^2 - 7x + 6}$

6) $\frac{1 - x^2}{x^3 - 1}$

7) $\dfrac{x^2 - 25}{x^2 - 16} \cdot \dfrac{x + 4}{x + 5}$

8) $\dfrac{x + 3}{4x^2 - 9} \div \dfrac{x^2 + 7x + 12}{2x^2 + 7x - 15}$

9) $\dfrac{x^2 - x - 6}{x^2 + 2x} \cdot \dfrac{x^3 + x^2}{x^2 - 2x - 3}$

10) $\dfrac{\dfrac{2x^2 - 3x - 2}{x^2 - 1}}{\dfrac{2x^2 + 5x + 2}{x^2 + x - 2}}$

11) $2 + \dfrac{x}{x + 3}$

12) $\dfrac{x}{x^2 + x - 2} - \dfrac{2}{x^2 - 5x + 4}$

13) $\dfrac{2}{x} + \dfrac{3}{x - 1} - \dfrac{4}{x^2 - x}$

14) $\dfrac{1}{x + 1} - \dfrac{2}{(x + 1)^2} + \dfrac{3}{x^2 - 1}$

15) $$\frac{\frac{x}{y} - \frac{y}{x}}{\frac{1}{x^2} - \frac{1}{y^2}}$$

16) $$\frac{1 - \frac{1}{x^2}}{x + \frac{1}{x^2}}$$

17) $$\frac{x^{-1} + y^{-1}}{(x + y)^{-1}}$$

18) $$1 + \frac{1}{1 + \frac{1}{1 + x}}$$