

You must be able to work this packet without the use of a calculator.

~~~ THERE WILL BE A TEST THE FIRST WEEK OF CLASS. ~~~

**I. Solving Equations & Simplifying Rational Expressions**

Note: Division symbol is /

1.  $15 = 3/10x - 15$

2.  $5 - 4(y + 1) = -3$

3.  $28 = 17/32x - 23$

4.  $-2 = 2(y - 1) - y$

5.  $41 - 2x = 2 + x$

6.  $4(3 - x) - 5 + 2x = 13$

7.  $3(b + 2) + 2(b - 3) = -5$

8.  $3n + 3(1 - n) = n - 6$

9.  $6(2 + y) = 4(3 - y)$

10.  $\frac{3}{x + 1} = \frac{9}{4x + 5}$

11.  $\frac{x - 3}{x + 5} = \frac{x}{x + 2}$

12.  $\frac{x}{x^2 - 2} = \frac{-1}{x}$

13.  $\frac{48x y^3}{y} \cdot \frac{x^2 y}{6x^3 y^2}$

14.  $\frac{4x + 20}{x^2} \cdot \frac{x^2 + x}{2x + 10}$

15.  $\frac{8x^2 y^2 z}{xz^3} \div \frac{10xy}{x z}$

16.  $\frac{x^2 + 12x + 32}{6x + 42} \div \frac{x^2 + 4x}{x^2 - 49}$

## II. Factoring Review

### Multiplying

|                                 |                                                             |
|---------------------------------|-------------------------------------------------------------|
| <b>Perfect Square Trinomial</b> | $(a+b)^2 = a^2 + 2ab + b^2$ and $(a-b)^2 = a^2 - 2ab + b^2$ |
|---------------------------------|-------------------------------------------------------------|

1.  $(x + 5)(2x - 3)$

2.  $(2x - 5)^2$

3.  $(x^2 - 2x + 1)(x + 3)$

### Special Cases

|                                                |                                                                                           |
|------------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>Perfect Square Binomials</b>                | $a^2 - b^2 = (a + b)(a - b)$                                                              |
| <b>Perfect Square Trinomials</b>               | $a^2 + 2ab + b^2 = (a+b)^2$<br>$a^2 - 2ab + b^2 = (a-b)^2$                                |
| <b>Factor by Grouping or Guess &amp; Check</b> | Example: $x^2 + 8x + 15 = x^2 + 5x + 3x + 15 = x(x + 5) + 3(x + 5)$<br>$= (x + 3)(x + 5)$ |
|                                                | Remember to factor out <i>GCF</i> first.                                                  |

1.  $x^2 + 4x - 21$

2.  $9x^2 + 3x - 2$

3.  $x^2 + 7xy + 10y^2$

4.  $x^2 - 9$

5.  $9x^2 - x - 8$

6.  $3y^2 - 5xy + 2x^2$

7.  $x^2 + 8x + 15$

8.  $2x^3 + 4x^2 - 16x$

9.  $12x^2 - 5x - 2$

10.  $x^2 + 10x + 25$

11.  $3x^2 - 3$

12.  $3x^3y - 9x^2y - 30xy$

13.  $4x^2 + 16x + 15$

14.  $12x^3 - 36x$

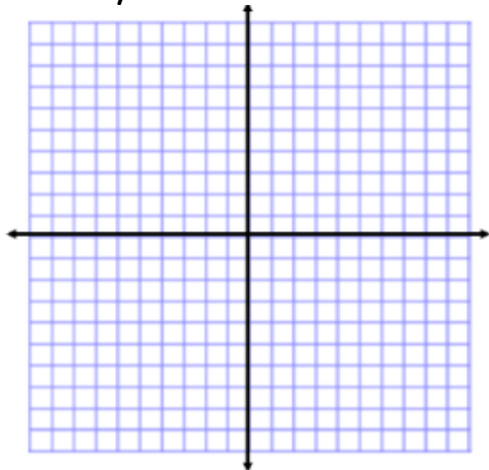
15.  $12 - 11x + 2x^2$

### III. Equations of Lines

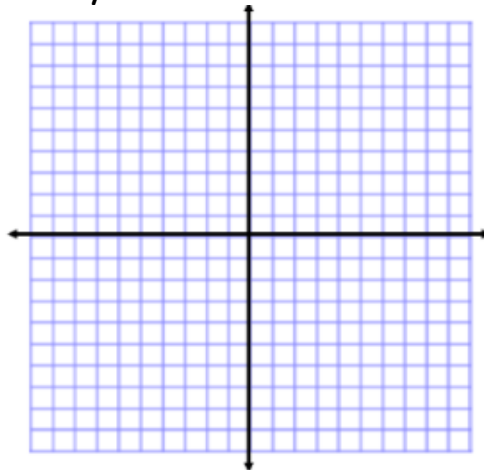
|                        |                                   |
|------------------------|-----------------------------------|
| Slope-Intercept Form   | $y = mx + b$                      |
| Point-Slope Form       | $y - y_1 = m(x - x_1)$            |
| Standard Form          | $ax + by = c$                     |
| Slope Formula          | $m = \frac{y_2 - y_1}{x_2 - x_1}$ |
| Horizontal Lines       | Slope = 0 ( $y = \#$ )            |
| Vertical Lines         | Slope is Undefined. ( $x = \#$ )  |
| Parallel Lines         | Slopes are the same.              |
| Perpendicular Lines    | Slopes are opposite reciprocals.  |
| To find y-intercept... | Set $x = 0$ & solve for $y$ .     |
| To find x-intercept... | Set $y = 0$ & solve for $x$ .     |

Graph the equation of the line. Show equation rewritten in  $y =$  form.

1.  $x + 2y = 0$

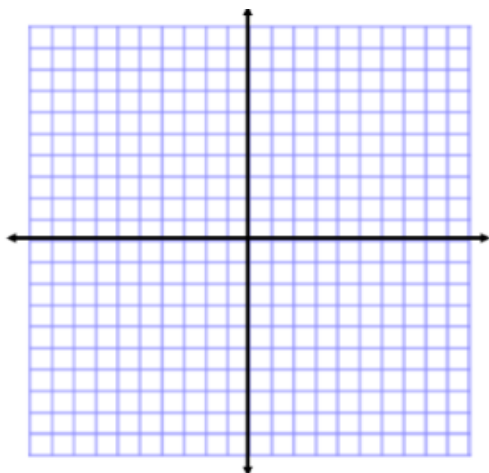


2.  $3x - 2y + 4 = 0$

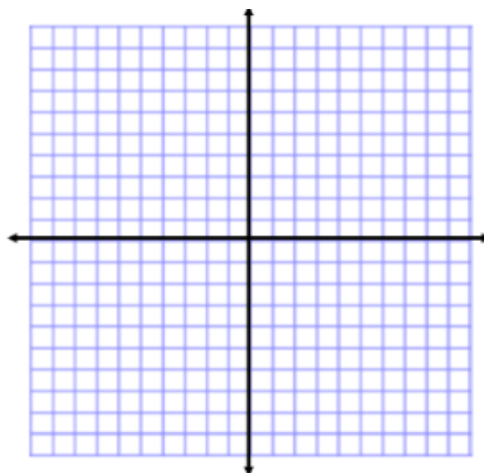


3.  $-x + 3y + 5 = x$

4.  $y = 2x + 3$  and  $y = 2x + 5$   
Describe and explain why.



5.  $y = 3x + 2$  and  $y = -1/3x + 5$   
Describe and explain why.



Write the equation of the line in slope-intercept form, point-slope form, and standard form.

1.  $(-1,-1), (2,8)$

2.  $(1,-4), (-2,8)$

3. x-int is  $-1$ , y-int is  $3$

4.  $f(1) = -2, f(2) = 1$

5.  $f(2) = 0, f(0) = 5$

6. x-int is  $-6$ , y-int is  $-4$

7.  $(6, -1), m = 3$

8.  $(-3,2), m = -1$

9.  $(-1,-6), m = 1/3$

### III. Solving Systems of Linear Equations

Solve using the indicated method.

1.  $2x + 5y = 8$  (Elimination)  
 $6x + y = 10$

2.  $3x + y = 6$  (Substitution)  
 $6x - 5y = 12$

3.  $3x + 4y = 2$  (Elimination)  
 $2x + 5y = -1$

4.  $3x + 4y = 2$  (Substitution)  
 $2x + 5y = -1$

5.  $y = -3x - 2$  (Graphing)  
 $5x + 2y = -2$

6.  $5x - 4y = 3$  (Graphing)  
 $3x + 2y = 15$