

## HONORS ALGEBRA II SUMMER REVIEW PACKET

Your high school mathematics courses are cumulative. This means that you will need to utilize concepts previously learned to be successful. The reason for this review is to reacquaint you with necessary skills to be successful in Honors Algebra II.

NONE of these problems require a calculator. You should be able to complete these problems without using a calculator. An answer key is provided for problems #1-98.

Here are some websites that will help to refresh your memory if you get stuck.

### Text Lessons

[www.math.com](http://www.math.com)

[www.freemathhelp.com](http://www.freemathhelp.com)

[www.mathforum.org](http://www.mathforum.org)

[www.webmath.com](http://www.webmath.com)

[www.purplemath.com](http://www.purplemath.com)

### Video Lessons

[www.mathispower4u.com](http://www.mathispower4u.com)

[www.brightstorm.com](http://www.brightstorm.com)

[www.brainpop.com](http://www.brainpop.com)

Good luck! We look forward to seeing you at Evergreen High School!

## ALGEBRA II HONORS SUMMER PACKET

### Objective 1: Solve equations.

Solve for x. Show all work and circle your answer.

1.  $6x - 2 = 5x - 7 - 3x$

2.  $3(8x - 5) = -4(7 - 6x)$

3.  $3(x - 5) + 8x = 18 - (3 - 10x)$

4.  $3(8x - 5) + 3 = 22x + 2(x - 6)$

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

6.  $t = \frac{pd}{2x}$

7.  $c + ax = dx$

8.  $|3x + 19| = 13$

9.  $\left|4 - \frac{x}{5}\right| = 10$

10.  $7 - |4x + 1| = -2$

**Objective 2: Solve inequalities and graph on a number line.**

Solve each inequality, make a number line, and graph your answer on your number line. Show all work.

11.  $36 - 11x \geq -63$

12.  $7x - 12 \leq 9(2x - 3)$

13.  $5 - 3(10 - 7x) < 4(2x + 10)$

14.  $12 < x + 3$  or  $-5 \leq 1 - x$

15.  $14 < 5 - 3x \leq 53$

16.  $52 < 4 - 3x < 13$

17.  $7 - 3x \geq -5$  and  $-2 \leq 5 - 7x$

18.  $3x - 13 < -4$  or  $7 - 2x \leq 5$

19.  $|-8 + x| \leq 6$

20.  $|x + 7| > 12$

21.  $|7 - x| < 6$

22.  $|5x - 10| \geq 15$

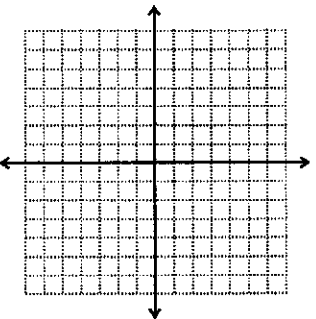
23.  $|4x-9|+20 > 35$

24.  $5-3|4x+3| > 2$

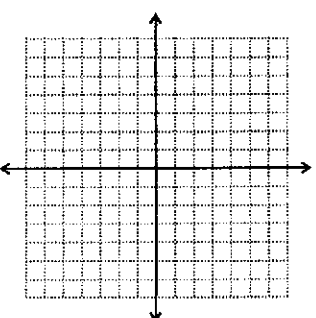
**Objective 3: Graph linear inequalities.**

Graph each inequality on a separate coordinate plane. Show all work.

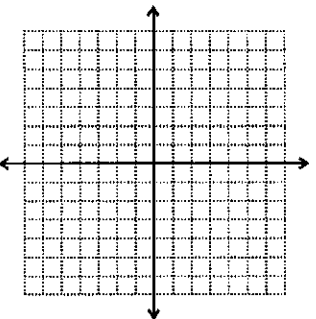
25.  $x > -6$



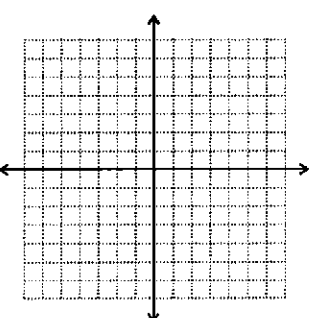
26.  $x-2y > 4$



27.  $6x-8y \geq -16$



28.  $y > -x$



**Objective 4: Find slope.**

Find the slope of the line. Show all work.

29. through  $(4, 9)$  and  $(11, 5)$

30. through  $(8, -1)$  and  $(-8, -1)$

31. through  $(-3, 6)$  and  $(-3, 0)$

32.  $x = -2$

33.  $6x-10y = -1$

34.  $y = -1$

35. parallel to  $5x-y = 2$

36. perpendicular to  $3x-5y = 7$

**Objective 5: Find x intercept.**

**Objective 6: Find y intercept.**

Find the x and y intercepts of the line. x and y intercepts must be given as an ordered pair.  
Show all work.

37.  $10x - 4y = -20$

38.  $y = 2x + 3$

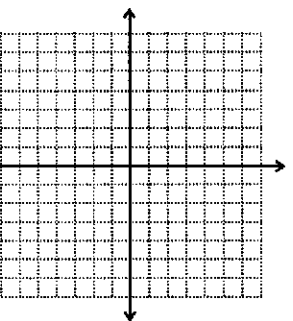
39.  $x = 3$

40.  $y = -7$

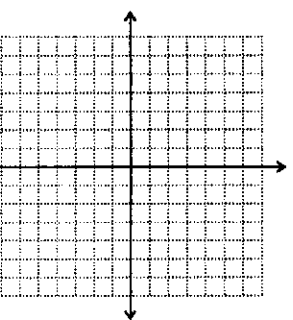
**Objective 7: Graph linear equations.**

Graph each line on the coordinate plane provided. Show all work necessary to graph the line.

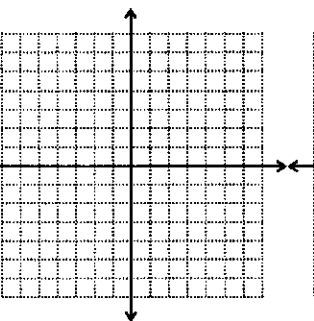
41.  $x = 5$



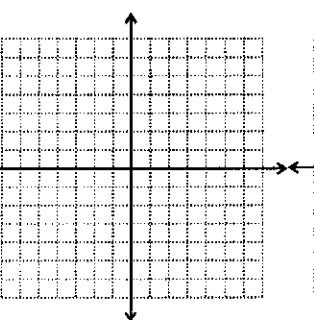
42.  $3y = 12$



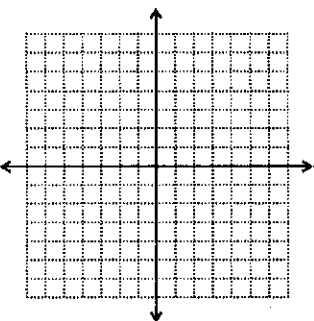
43.  $y = \frac{1}{5}x - 5$



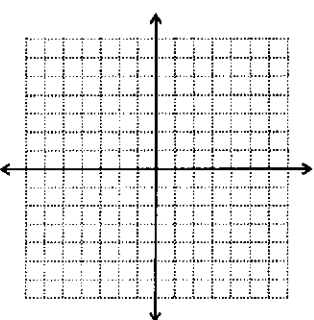
44.  $y = -3x$



45.  $4x - y = -2$



46.  $3x - 8y + 24 = 0$



**Objective 8: Write the equation of a line.**

Write the equation of the line in slope-intercept form. Show all work and circle your answer.

47. slope = -2, y-intercept (0, -7)

48. slope = -4, passing through (-2,-5)

49. x-intercept (-3,0), y-intercept (0,9)

50. passing through (6,-5) and (-2,7)

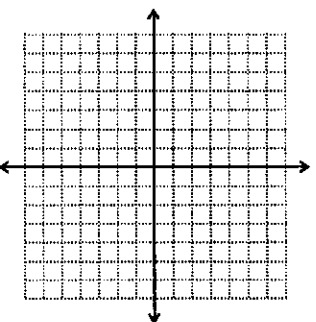
51. parallel to  $2x - 3y = 6$  and passing through (-2,5)

52. perpendicular to  $y = -2x + 6$  and passing through (-4,2)

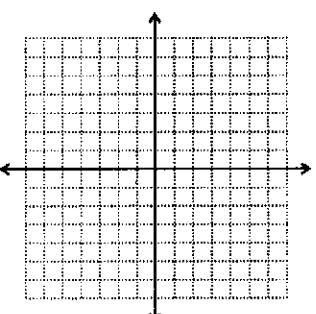
**Objective 9: Solve linear systems of equations.**

Solve by graphing on the coordinate plane provided. Show all work. Answers should be in the form of an ordered pair where appropriate. **If the lines are coincident write all points on the line and name the line. Write no solution for parallel lines.** Put your answer in the blank.

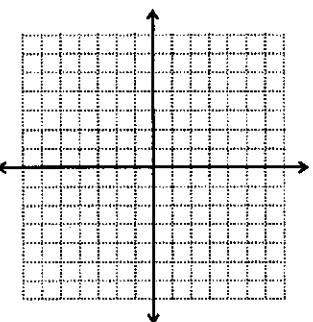
53. 
$$\begin{cases} x + 6 = 0 \\ 4y + 12 = 0 \end{cases}$$



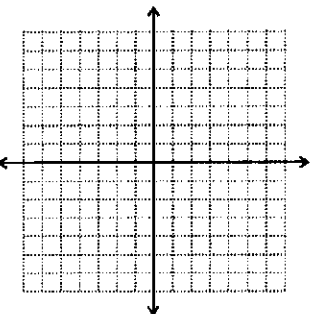
54. 
$$\begin{cases} 3x - 3y = 0 \\ 5x - 5y = 0 \end{cases}$$



55. 
$$\begin{cases} y = \frac{3}{2}x - 9 \\ x - 5y - 6 = 0 \end{cases}$$



56. 
$$\begin{cases} -2x + 10y - 2 = 0 \\ x - 5y + 2 = 0 \end{cases}$$



Solve by substitution or elimination (linear combination). Answers should be in the form of an ordered pair where appropriate. If the lines are coincident write all points on the line and name the line. Write no solution for parallel lines. Show all work and circle your answer.

57. 
$$\begin{cases} 4x - 6y = 20 \\ 2x - 3y = 10 \end{cases}$$

58. 
$$\begin{cases} 2x + 3y = 20 \\ 6x - y = 20 \end{cases}$$

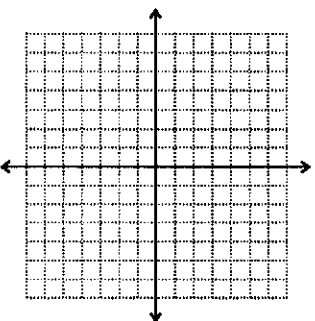
59. 
$$\begin{cases} 12x - 10y = 0 \\ -6x + 5y = 2 \end{cases}$$

60. 
$$\begin{cases} x + 3y - 5 = 0 \\ 2x + 6y - 10 = 0 \end{cases}$$

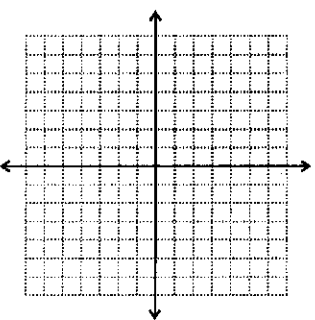
**Objective 10: Graph systems of linear inequalities.**

Graph the system of linear inequalities on the coordinate plane. Shade only the solution area. Show all work.

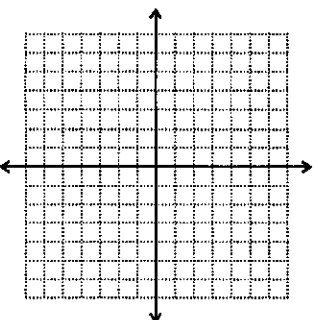
61. 
$$\begin{cases} x < 5 \\ y \geq 2 \end{cases}$$



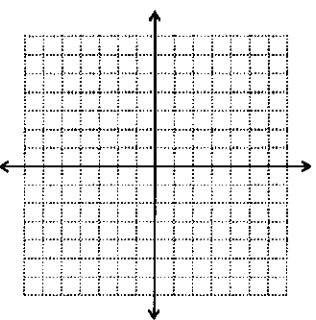
62. 
$$\begin{cases} x - 3y < 0 \\ y \geq -x + 4 \end{cases}$$



63. 
$$\begin{cases} y < -2x \\ y > -2x + 3 \end{cases}$$



64. 
$$\begin{cases} y \geq -1 \\ x + y < 3 \end{cases}$$



**Objective 11: Simplify integral exponential expressions.**

Simplify. Show all work and circle your answer.

65.  $d^2d^4$

66.  $(-a)^2(-a)^3$

67.  $(9y^{-4})^2$

68.  $(-3r^4t)^3 \cdot 2rt^4$

69.  $\frac{3}{3^4}$

70.  $\frac{wz^9}{z^{12}}$

71.  $\frac{a^{10}b^2}{a^4b^9}$

72.  $\left(-\frac{mr^4}{p^2}\right)^{-5}$

73.  $\frac{(xy^3)^2}{xy^{-1}}$

74.  $\frac{(w^2z^4)^3}{(-wz^5)^2(w^4z^2)}$

**Objective 12: Factor**

Factor completely. Show all work and circle your answer.

75.  $x^2 - 49$

76.  $x^2 + y^2$

77.  $3x^3 - 75x$

78.  $x^4 - 81$

79.  $3x^2 - 12x$

80.  $x^2 - 3x - 28$

81.  $3x^2 - 8x + 5$

82.  $2x^2 + 13x + 21$

83.  $x^2 - 6x + 8$

84.  $12x^2 - 40x - 32$

85.  $6x^2 - 7x - 10$

86.  $6x^2 - 30x + 24$



**Objective 13: Solve quadratic equations.**

Solve by factoring. Show all work and circle your answer.

87.  $4x^2 - 2x = 0$

88.  $x^2 - 3x - 10 = 0$

89.  $x^2 + 10x + 21 = 0$

90.  $3x^2 - 90x - 192 = 0$

91.  $x^2 - 25 = 0$

92.  $8x^2 - 16x + 8 = 0$

93.  $2x^2 + 7x + 5 = 0$

94.  $10x^2 + 23x - 5 = 0$

Solve by using the quadratic formula. Show all work and circle your answer.

95.  $15x^2 - 1 = 2x$

96.  $5x^2 + x = 5$

97.  $x^2 + 6x + 1 = 0$






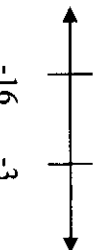
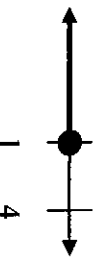

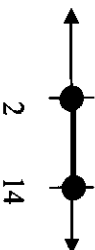
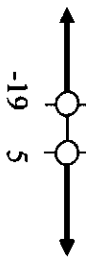

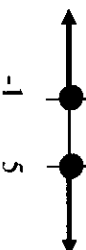


98.  $5x^2 - 10x + 3 = 0$

## ANSWERS

### Objective 1

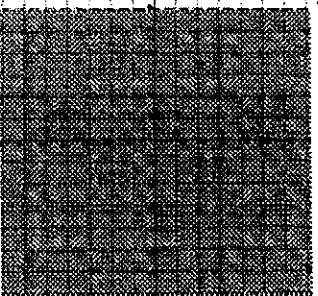
- $x = -\frac{5}{4}$
- no solution
- $x = 30$
- all real numbers
- $x = -c$
- $x = \frac{pd}{2t}$
- $x = \frac{-c}{a-d}$   $\left( \text{or } x = \frac{c}{d-a} \right)$
- $x = -2$  or  $x = \frac{-32}{3}$
- $x = 2$  or  $x = \frac{-5}{2}$
- $x = -30$  or  $x = 70$

### Objective 2

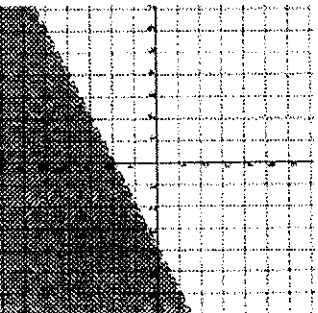
- $x \leq 9$   

- $x \geq \frac{15}{11}$   

- $x < 5$   

- $x \leq 6$  or  $x > 9$   

- $-16 \leq x < -3$   

- no solution  

- $x \leq 1$   

- all real numbers  

- $2 \leq x \leq 14$   

- $x < -19$  or  $x > 5$   

- $1 < x < 13$   

- $x \leq -1$  or  $x \geq 5$   

- $x < -\frac{3}{2}$  or  $x > 6$   

- $-1 < x < -\frac{1}{2}$   


**Objective 3**

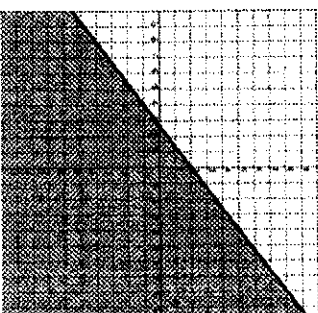
25.



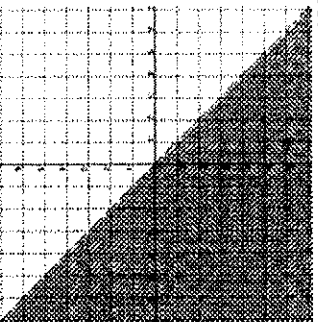
26.



27.



28.



**Objective 4**

29.  $-\frac{4}{7}$

32. undefined

35. 5

30. 0

33.  $\frac{3}{5}$

36.  $-\frac{5}{3}$

31. undefined

34. 0

**Objectives 5 & 6**

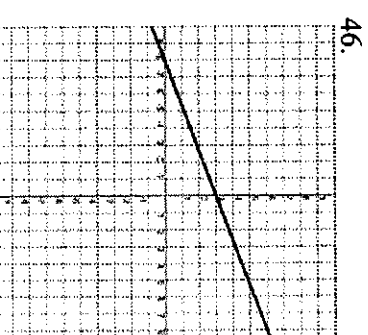
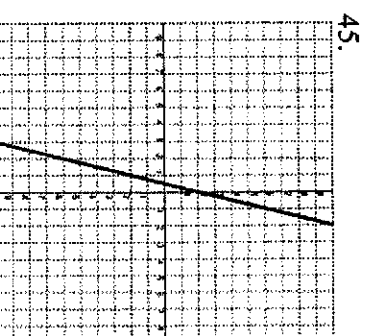
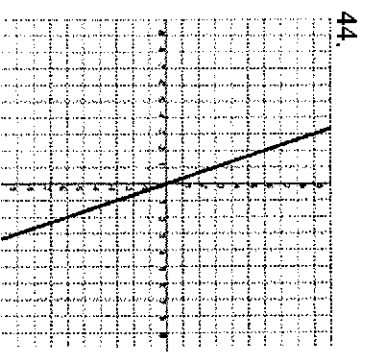
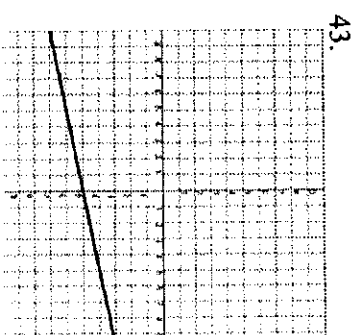
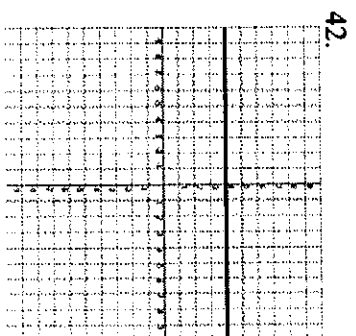
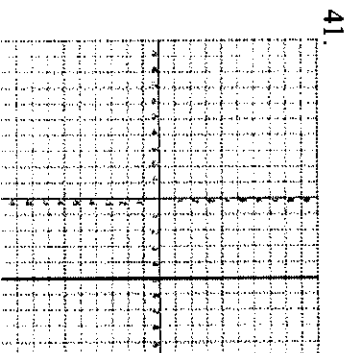
37.  $(-2,0), (0,5)$

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

39.  $(3,0)$ , no y-intercept

40.  $(0,-7)$ , no x-intercept

**Objective 7**



**Objective 8**

47.  $y = -2x - 7$

48.  $y = -4x - 13$

49.  $y = 3x + 9$

50.  $y = -\frac{3}{2}x + 4$

51.  $y = \frac{2}{3}x + \frac{19}{3}$

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

**Objective 9**

53.  $(-6, -3)$

54. all points on the line  
 $3x - 3y = 0$

55.  $(6, 0)$

56. no solution

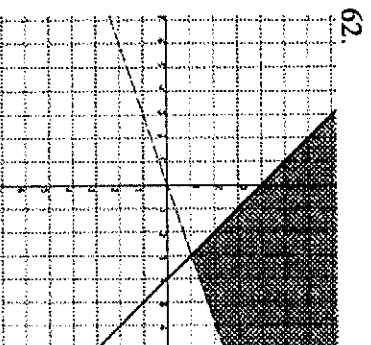
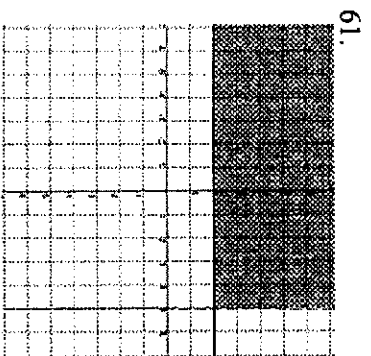
57. all points on the line  
 $4x - 6y = 20$

58.  $(4, 4)$

59. no solution

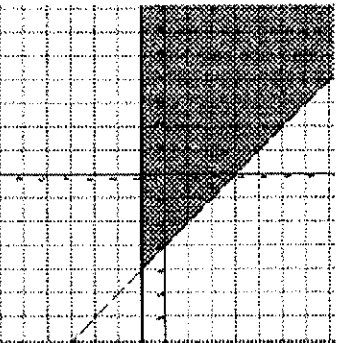
60. all points on the line  
 $x + 3y - 5 = 0$

**Objective 10**



63. no solution

64.



**Objective 11**

65.  $d^6$

66.  $-a^5$

67.  $\frac{81}{y^8}$

68.  $-54r^{13}t^7$

69.  $\frac{1}{27}$

70.  $\frac{w}{z^3}$

71.  $\frac{a^6}{b^7}$

72.  $-\frac{p^{10}}{m^5r^{20}}$

73.  $xy^7$

74. 1

**Objective 12**

75.  $(x-7)(x+7)$

76. cannot factor

77.  $3x(x-5)(x+5)$

78.  $(x^2+9)(x+3)(x-3)$

79.  $3x(x-4)$

80.  $(x-7)(x+4)$

81.  $(3x-5)(x-1)$

82.  $(2x+7)(x+3)$

83.  $(x-4)(x-2)$

84.  $4(3x+2)(x-4)$

85.  $(6x+5)(x-2)$

86.  $6(x-4)(x-1)$

**Objective 13**

87.  $\left\{0, \frac{1}{2}\right\}$

88.  $\{5, -2\}$

89.  $\{-7, -3\}$

90.  $\{32, -2\}$

91.  $\{-5, 5\}$

92.  $\{1\}$

93.  $\left\{-\frac{5}{2}, -1\right\}$

94.  $\left\{-\frac{5}{2}, \frac{1}{5}\right\}$

95.  $\left\{\frac{1}{3}, -\frac{1}{5}\right\}$

96.  $\left\{\frac{-1 \pm \sqrt{101}}{10}\right\}$

97.  $\{-3 \pm 2\sqrt{2}\}$

98.  $\left\{\frac{5 \pm \sqrt{10}}{5}\right\}$

Name: \_\_\_\_\_

### Order of Operations:

Evaluate each expression. Write your answer in simplest form.

- $4^2 \bullet 2 + [7 - (3^2 - 5)]$
- $[15(10) - 12(10)] \div 10$
- $(8 - 4) \bullet (12 - 3) \bullet \frac{1}{2}(2 + 1 \times 2)$
- $4[(3 + 2 \times 3) - 5] + 7$
- $8 \div 0.4 \times 2 - 2 \times 2$
- $3^2 + 7 \times 2 - 8 \times 2$

### Fractions:

Evaluate each expression. Write your answer in simplest form. Where applicable, leave your answers as improper fractions (reduce, reduce, reduce, reduce, NO DECIMALS!)

- $\frac{1}{3} \left( \frac{5}{6} - \frac{3}{4} + \frac{2}{3} \right)$
- $\frac{\frac{3}{9} - \frac{8}{12}}{\frac{3}{8} \bullet 2}$
- $9 - \frac{4}{9} \bullet \frac{3}{2} - \frac{5}{6} + 3$
- $10. \left( 4 - \frac{5}{6} + 3 \times 2 \right) \div \frac{5}{6}$
- $11. \frac{\frac{2}{3} + 4}{\frac{5}{6}}$
- $12. \frac{\frac{3}{2} + \frac{3}{4} + \frac{3}{8}}{21}$

### Exponents:

Simplify each expression. Write your answer in simplest form. Where applicable, leave answers as improper fractions. The simplified expressions should have no negative exponents.

- $\frac{4x^8}{6x^{-5}}$
- $(6xy^2)(-8x + 9y)$
- $(3x \bullet x^3)^{-2}$
- $\frac{x^2y}{3y^3x^3}$
- $(12xy)^0(x^2y^4)^5$
- $18. \frac{2x^{-2}y}{3y^{-3}x^2}$

Name \_\_\_\_\_

Date \_\_\_\_\_

Period \_\_\_\_\_

.....**Relations and Functions, Domain and Range.**.....

For each function, find  $f(-2)$ ,  $f\left(-\frac{1}{2}\right)$ , and  $f(3)$ .

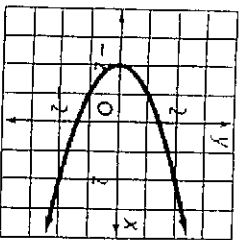
1.  $f(x) = 5x + 2$

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

3.  $f(x) = -3x + 1.8$

Use the vertical line test to determine whether each graph represents a function. State the domain and range using interval notation.

4.

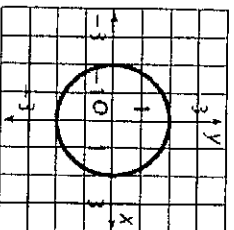


Function? \_\_\_\_\_

D: \_\_\_\_\_

R: \_\_\_\_\_

5.

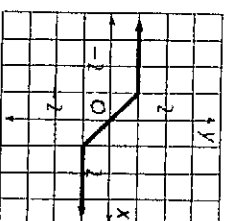


Function? \_\_\_\_\_

D: \_\_\_\_\_

R: \_\_\_\_\_

6.

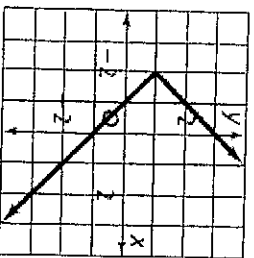


Function? \_\_\_\_\_

D: \_\_\_\_\_

R: \_\_\_\_\_

7.

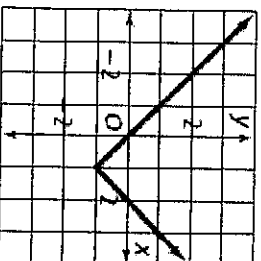


Function? \_\_\_\_\_

D: \_\_\_\_\_

R: \_\_\_\_\_

8.

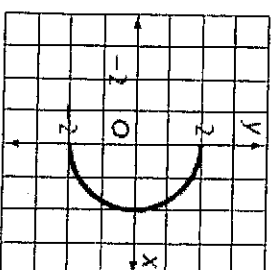


Function? \_\_\_\_\_

D: \_\_\_\_\_

R: \_\_\_\_\_

9.



Function? \_\_\_\_\_

D: \_\_\_\_\_

R: \_\_\_\_\_

Find the domain and range. Determine whether the relation is a function.

10.  $\{(1, 2), (2, 3), (2, 4), (3, 5)\}$

11.  $\{(-1, 1), (0, 0), (1, 1), (2, 4), (3, 9)\}$

Suppose  $f(x) = -3x + 2$  and  $g(x) = \frac{1}{2}x - 1$ . Find each value.

12.  $f\left(\frac{1}{3}\right)$

13.  $3g(4)$

14.  $\frac{g(-2)}{f(3)}$

15.  $\frac{f(-1)}{g(5)}$

State only the domain using interval notation.

16.  $f(x) = \frac{7}{x+4}$

17.  $f(x) = \sqrt{2x-6}$

18.  $f(x) = 4x + 18$



**Honors Geometry – REVIEW Rational Expressions****SHOW ALL WORK IN YOUR NOTEBOOK.****Simplify each rational expression.**

1.  $\frac{20+40x}{20x}$

2.  $\frac{4x+6}{2x+3}$

3.  $\frac{3y^2-3}{y^2-1}$

4.  $\frac{x^2+x}{x^2+2x}$

5.  $\frac{x^2+3x-18}{x^2-36}$

6.  $\frac{2x^2+11x+5}{3x^2+17x+10}$

**Multiply or divide. Write the answer in simplest form.**

7.  $\frac{5a}{5a+5} \cdot \frac{10a+10}{a}$

8.  $\frac{9-x^2}{5x^3+17x^2+6x} \cdot \frac{5x^2+2x}{x-3}$

9.  $\frac{3y+3}{6y+12} \div \frac{18}{5y+5}$

10.  $\frac{6x^2-32x+10}{3x^2-15x} \div \frac{3x^2+11x-4}{2x^2-32}$

11.  $\frac{5y-20}{3y+15} \cdot \frac{7y+35}{10y+40}$

12.  $\frac{(y+6)^2}{y^2-36} \cdot \frac{3y-18}{2y+12}$

**Simplify by adding or subtracting. Write the answer in simplest form.**

13.  $\frac{4}{x^2-25} + \frac{6}{x^2+6x+5}$

14.  $\frac{3}{7x^2y} + \frac{4}{21xy^2}$

16.  $\frac{3}{x-9} + 4x$

17.  $\frac{4}{x^2-3x} + \frac{6}{3x-9}$

18.  $\frac{3}{x^2-x-6} + \frac{2}{x^2+6x+5}$

19.  $\frac{2a}{a+2} + \frac{3a}{a-2}$

20.  $\frac{6x^2}{3x-2} + \frac{5x-6}{3x-2}$

21.  $\frac{3}{x^2+3x-10} + \frac{1}{x^2+6x+5}$

22.  $\frac{f+1}{fgh} + \frac{f-1}{fgh}$

**Solve each equation.**

23.  $\frac{1}{2x+2} = \frac{1}{x-1}$

24.  $\frac{2}{x+2} + \frac{5}{x-2} = \frac{6}{x^2-4}$

25.  $\frac{5+\frac{5}{x}}{x} = \frac{6}{5x}$

26.  $5 - \frac{4}{x+1} = 6$

27.  $\frac{4}{x-3} = \frac{2}{x+1} + \frac{16}{x^2-2x-3}$

28.  $\frac{7}{2} = \frac{7x}{8} - 4$

29.  $\frac{x}{3} + \frac{x}{2} = 10$

30.  $\frac{x}{x+3} - \frac{x}{x-3} = \frac{x^2+9}{x^2-9}$

31.  $4 + \frac{2y}{y-5} = \frac{8}{y-5}$

32.  $\frac{2}{3} + \frac{3x-1}{6} = \frac{5}{2}$

33.  $\frac{x+3}{x^2+3x-4} = \frac{x+2}{x^2-16}$

34.  $\frac{7}{x^2-5x} + \frac{2}{x} = \frac{3}{2x-10}$