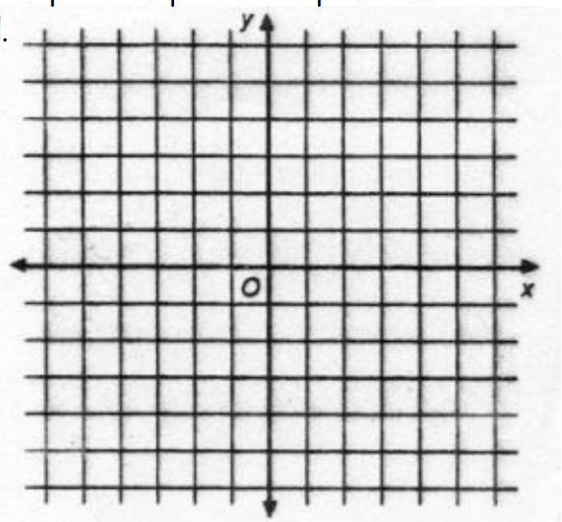
HONORS GEOMETRY
SUMMER REVIEW
(ALGEBRA SKILLS)

Directions: Solve the following problems. The more you can do, the easier the transition will be going into Honors Geometry next year. You may use a calculator on everything; most problems do not require one. Show your complete process for each problem. The answer key will be posted on the Grandview website.

Section I – Slope, Equations of Lines & Graphing Lines

When asked to write the equation of a line, use either point-slope or slope-intercept form.

For #'s 1 – 4 graph the following lines on the graph provided.



1) $x = 4$

2) $y = 2$

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

4) $y = 2x + 1$

5) a) Write the equation of the line through the points (2, -1) & (2, -6).

b) Write the equation of a horizontal line through the point (1, 5).

6) Write the equation for the lines provided.

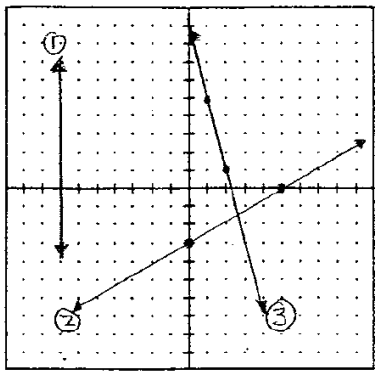
1) _____

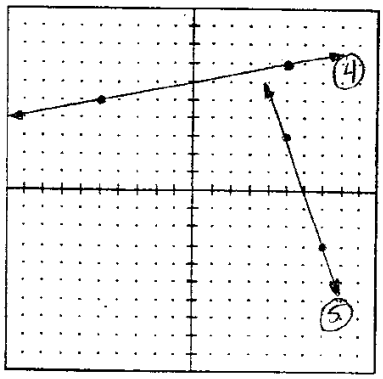
2) _____

3) _____

4) _____

5) _____





7) Write the equation of the line where slope = -5 & y-int. = 0.

8) Write the equation of the line that passes thru the points (1, -3) & (3, -5).

9) Find an equation of the line that passes through the point (2, -1) & is …

a) parallel to the line $2x - 3y = 5$

b) perpendicular to the line $2x - 3y = 5$

Section II – Factoring, Multiplying, & Combining Like Terms

For #'s 1 – 10, factor completely.

1) $3x^2 - 19x - 14$

2) $x^2 - 49$

3) $x^2 - 5x - 24$

4) $x^2 + 10x + 16$

5) $4x^2 + 16x$

6) $3x^3 - 12x^2$

7) $4x^3 + 6x^2 - 10x$

8) $9x^2 - 42x + 49$

9) $14x^2 - 19x - 3$

10) $81 - 9y^2$

For #'s 11 – 16, perform the indicated operation & simplify.

11) $(3x - 2)(3x + 2)$

12) $(x-4)^2$

13) $(4x - 3)(2x - 5)$

14) $(2x-y)^3$

15) $(3x^3 + 2x - 5) + (-5x^3 + 5)$

16) $(2x^2 + 3x - 1) + (x^3 + x^2 + 5) - (2x^2 - 5x + 7)$

Section III – Properties of Exponents & Radicals

For #'s 1 – 7, perform the indicated operation & simplify. Write your answers with no negative exponents.

1) $\frac{3}{7}+\frac{1}{4}$

2) $\frac{x}{2}-\frac{5x}{4}$

3) $\frac{6}{5}\div\frac{27}{75}$

4) $\frac{-3}{4}\bullet\frac{17}{34}$

5) $\frac{a^2}{2c}\div\frac{a}{4c}$

6) $\frac{24a}{3(b-1)}\div\frac{3a^2}{b-1}$

7) $\frac{4x^3y^2}{3y}\bullet\frac{4xy}{x^2}$

For #'s 8 – 22, perform the indicated operation and simplify according to properties of exponents. Write your answers with no negative exponents.

8) $(3^5)(3^{-2})$

9) $(2xy^2)(3x^3y)$

10) $(2x^{-4})^{-3}$

11) $(3ab^2c)(4bc)$

12) $\left(\frac{3a^{-1}}{5c^2}\right)^2$

13) $\left(\frac{x^2y^4}{x^3y^{-3}}\right)^{-5}$

14) $\frac{x^{8a}y^{4b}}{x^{2a}y^b}$

15) 4^{-3}

16) $7\sqrt{12}-2\sqrt{48}$

17) $\sqrt{45x^3y^5}$

18) $\sqrt{25x^2y^4}$

19) $(-2x^2)^3$

20) $(4x^3)^{-1}$

21) $(2xy)^0$

22) $(3xy)^2(2x^2y)^3$

Section IV - Solving Equations

Solve the equations provided.

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

2) $4(2x-3)=6-(3-2x)$

3) $6\left[x-\left(2x+3\right)\right]=8-5x$

4) $\frac{2}{3}x=8$

5) $4x+3=8x-13$

6) $\frac{1}{2}\left(4x-10\right)=-2$

7) $4x-7\left(3x+6\right)=3-2x$

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

9) $\frac{6}{x}-\frac{2}{x+3}=\frac{3\left(x+5\right)}{x\left(x+3\right)}$

10) $x^2+2(3x-2)=x^2+6x-4$

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

12) $\frac{1}{x-2}+\frac{3}{x+3}=\frac{4}{x^2+x-6}$

Section V – Solving Systems of Equations

Solve the following by the method of your choice (i.e., substitution or elimination).

1) $-2x + y = 7$
$\frac{1}{2}x - y = -1$

2) $x - y = 3$
$x + y = 1$

3) $5x + 2y = 2$
$4x + 3y = 4$

4) $3x + 2y = 8$
$2x + y = 5$

5) $-2x + 5y = -23$
$24 + 4y = 3x$

6) $6x = 10 - 2y$
$3x + y = 5$

7) $6x - 8y = 2$
$\frac{9}{2}x - 6y = \frac{3}{2}$

8) $2x + 3y = 10$
$5x - 4y = 2$

9) $10x + 4y = 12$
$y = -\frac{5}{2}x + 2$

10) $-2y + 3x = 3$
$-6x + 4y = -6$

Section VI – Solving Quadratic Equations

For #'s 1 – 6, solve by factoring.

1) $0 = x^2 + 2x - 8$

2) $9x^2 = 30x - 24$

3) $6x^2 + 17x + 5 = 0$

4) $0 = -4x + 12 - x^2$

5) $0 = -x^2 - 3x + 28$

6) $-48 = 2x^2 + 20x$

For #'s 7 – 12, solve by completing the square.

7) $x^2 - 4x - 12 = 0$

8) $x^2 + 12x - 13 = 0$

9) $x^2 + 20x - 21 = 0$

10) $x^2 - 14x + 13 = 0$

11) $x^2 - 8x - 36 = 0$

12) $x^2 + 7x - 8 = 0$

For #'s 13 – 16, solve using the quadratic formula.

13) $0 = x^2 - 5x - 14$

14) $0 = 2x^2 + 3x - 20$

15) $0 = -2x^2 - x - 1$

16) $0 = 9x^2 + 6x + 1$

For #'s 17 – 20, solve by the method of your choice.

17) $0 = 4x^2 - 16x + 13$

18) $2x^2 + 4x = 9x + 18$

19) $4x^2 + 16x + 15 = 0$

20) $6x^3 - 54x = 0$

Section VII – Simplifying Radical Expressions

In #'s 1 – 8, write each radical expression in simplest form. Rationalize denominators.

1) $\sqrt{32}$

2) $\sqrt{300}$

3) $5\sqrt{150}$

4) $15\sqrt{60}$

5) $\frac{3}{\sqrt{5}}$

6) $\frac{12}{5\sqrt{3}}$

7) $13\sqrt{5} - \sqrt{75}$

8) $\sqrt{28} + \sqrt{36} + \sqrt{63}$

9) $\left(3\sqrt{5}\right)^2$

10) $\left(5\sqrt{3}\right)\left(4\sqrt{6}\right)$