Summer Assignment for students ENTERING:
Algebra 2 Trigonometry Honors

Please have the following worksheets completed and ready to be handed in on the first day of class, August 16, 2023. Make sure you show your work where appropriate. Answers are provided for you to check at the end of this packet; however, you will not be given credit if you don't show work on problems that require it. Please neatly organize your work, show all your work, and place all your work and answers ON these worksheets. It is expected that you have a good understanding of this material coming into Algebra 2 Trigonometry Honors, as teachers will not be doing an extensive review of previously learned material.

Since this assignment is designed to start the year off strong, please wait until late July or early August to start and complete it.

Have a great summer and we look forward to seeing you in the fall!

The CCHS Math Department

Worksheet #1 **NAME** _____
Fractions

Do **NOT** use a calculator when completing this worksheet. Show work whenever possible.

Evaluate each expression and leave your answer in simplest form.

1] $\frac{7}{13}-\frac{4}{13}-\frac{2}{13}$

2] $3\frac{2}{5}-2\frac{3}{5}=$

3] $\frac{3}{8}+\frac{3}{4}$

4] $\frac{1}{2}+\frac{5}{7}$

5] $\frac{3}{8}-\frac{7}{4}$

6] $1\frac{1}{3}+2\frac{1}{6}$

7] $7\frac{1}{6}-5\frac{2}{3}$

8] $6\left(\frac{3}{8}\right)$

9] $\frac{4}{5}\bullet\frac{3}{8}$

10] $\left(-\frac{3}{5}\right)\left(-\frac{5}{9}\right)\left(-\frac{3}{10}\right)$

11] $2\frac{1}{3}\bullet 2\frac{1}{4}$

12] $\frac{4}{9}\div\frac{2}{3}$

13] $1\frac{3}{10} \div \frac{4}{5}$

Worksheet #2 **NAME** _____
Simplifying/Evaluating Expressions

Do **NOT** use a calculator when completing this worksheet. Show work whenever possible.

Evaluate each expression for the given value of x and/or y.

1] $x^5 - 2y^2, x = -1, y = 4$ **2]** $\frac{x-y}{2(x+y)}, x = 5, y = -3$ **3]** $4\left(\frac{y}{x}\right) - 2y^3, x = -\frac{1}{3}, y = 2$

4] $(3x)^2 - 2y^3, x = 4, y = -3$

Simplify each expression and leave your answer in simplest form. Also, be sure your answer is in standard form.

5] $3y(4-y)+2y^2$ **6]** $\frac{20x^2+30x-10}{-5}$ **7]** $x - 3(5x-3) - (2-x)$

8] $\frac{1}{3}(6-9x) - \frac{3}{5}(20-10x)$ **9]** $\frac{1}{2}(8-4x) + \frac{1}{3}(6x-9)$

Let p represent a positive number and n represent a negative number. Determine if the given expressions will be *always positive*, *always negative* or *sometime positive* and *sometimes negative*. Be prepared to support your decision.

10] np^6 **11]** $-(n)^2$ **12]** $(-p)^2$

Worksheet #3 **NAME** _____

Solving Linear Equations

Do **NOT** use a calculator when completing this worksheet. Show work whenever possible.

Solve the following equations for x. **You must show all algebraic steps.** Please also include a **CHECK** of your solution.

1] $\frac{3}{4}x-\frac{10}{3}=5+\frac{x}{2}$ **2]** $14x-(6x+4)=3x+5(x-1)+1$ **3]** $6.2x+11.8=3.8(x+1)$

4] $4-2(x-11)=3(x+4)-6$ **5]** $\frac{1}{4}(4-\mathrm{x})=10+2\mathrm{x}$ **6]** $\frac{1}{5}\mathrm{x}=7-\frac{4}{5}\mathrm{x}$

7] $\frac{1}{4}\mathrm{x}+12=\frac{-1}{4}\mathrm{x}$ **8]** $2(\mathrm{x}-1)=\frac{3}{5}(10+5\mathrm{x})$ **9]** $2(p-2p+3p-4)=4(p-3)$

10] $\frac{6-5t}{4}=3t+1$

Worksheet #4 **NAME** _____
Solving Literal Equations

Do **NOT** use a calculator when completing this worksheet. Show work whenever possible.

For each equation below,

a) Solve each equation for y in terms of x, showing your work.

b) Then evaluate when x = 2.

1] $-\frac{2}{3}x+\frac{1}{5}y=1$

2] $\frac{1}{4}y+3x-6=y+21$

Solve each equation for the indicated variable.

3] $p=2\ell+2w$ for ℓ

4] $LA=2\pi rh$ for h

5] $V=\frac{1}{3}(\ell \bullet w \bullet h)$ for w

6] $C=\frac{5}{9}(F-32)$ for F

7] $A=\frac{1}{2}h(b_1+b_2)$ for b_1

8] $PV=nrt$ for t

9] $d = \sqrt{\ell^2 + w^2 + h^2}$ for ℓ **10]** $I = P(1+r)^t$ for P

Worksheet #5 **NAME** _____
Linear Functions and Inequalities

Do **NOT** use a calculator when completing this worksheet. Show work whenever possible.
Please **DO** use a straightedge when graphing.

Find the slope of the line passing through the given points. Include your work.

1] $(-2,5),\ (-8,1)$ **2]** $(-3,8),\ (-3,4)$

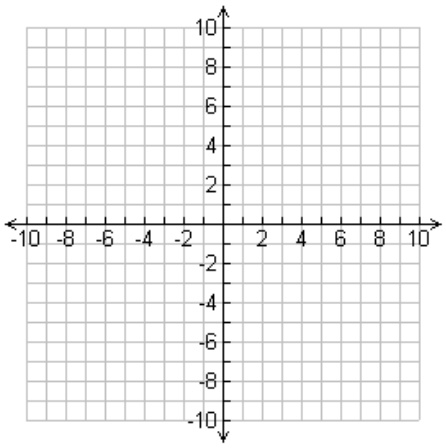
Find the equation of the line in slope-intercept form ($y = mx + b$) using the given information.

3] $slope = 5,\ y-\text{int} = 2$ **4]** $m = -4,\ b = -9$

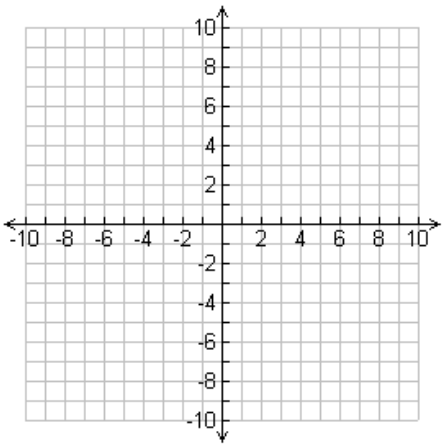
5] $m = -2,$ *goes through* $(-1,-4)$ **6]** *goes through* $(5,7)$ & $(8,1)$

Graph the functions.

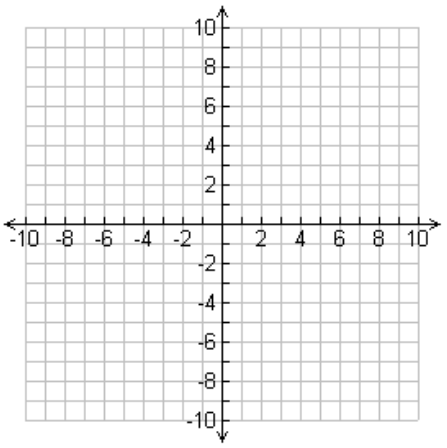
7] $y = 2x - 3$



8] $y = -x$

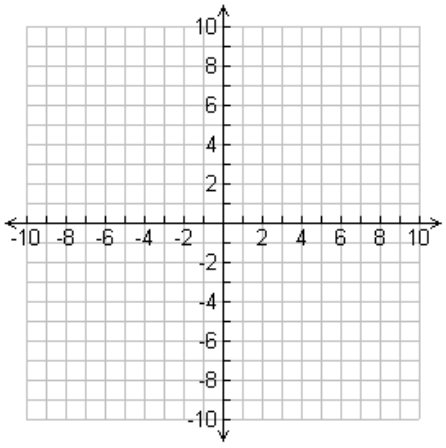


9] $y = 4$

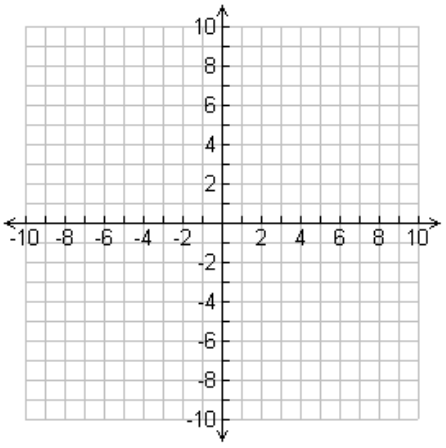


Graph the functions.

10] $x = -4$

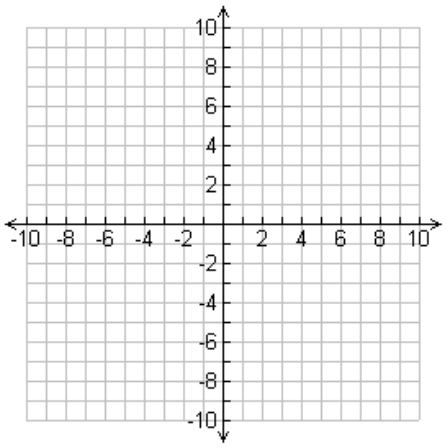


11] $2x + 4y = 8$

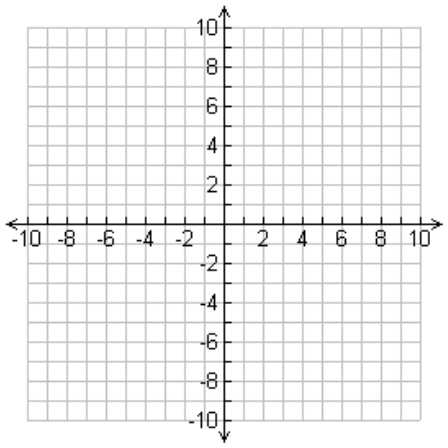


Graph the inequalities.

12] $y \geq -\frac{2}{3}x$



13] $4x - 2y > 12$

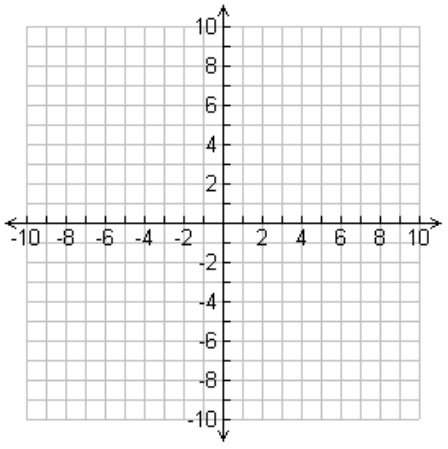


Worksheet #6 **NAME** _____
Systems of Equations

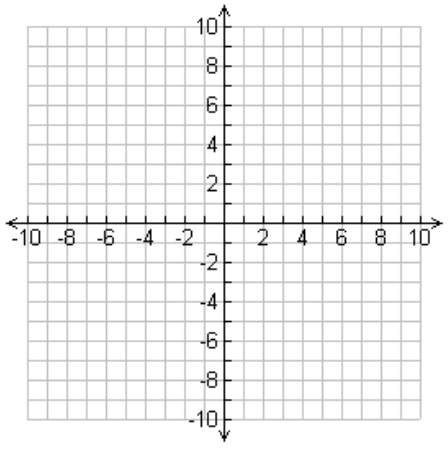
Do **NOT** use a calculator when completing this worksheet. Show work whenever possible.
Please **DO** use a straightedge when graphing.

Solve each system of equations by graphing.

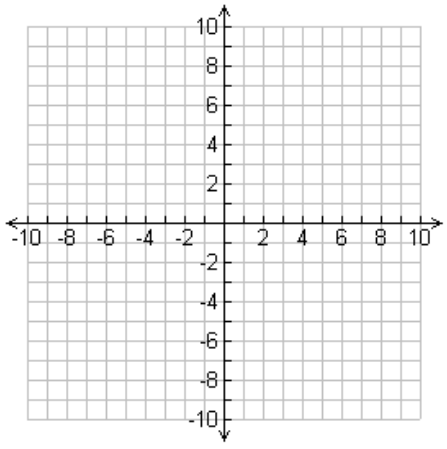
1] $\begin{cases} y = x + 3 \\ y = -\frac{1}{2}x + 6 \end{cases}$



2] $\begin{cases} 4x + 3y = 12 \\ y = -\frac{4}{3}x + 4 \end{cases}$



3] $\begin{cases} 4x - 2y = 12 \\ y = 2x + 6 \end{cases}$



Solve the following systems of equations using the substitution method or the elimination method. Remember to write your solution as an ordered pair. CHECK your solution in both original equations.

4] $\begin{cases} y = x + 4 \\ 3x + y = 16 \end{cases}$

5] $\begin{cases} 8x - 4y = 4 \\ 4x - 2y = -3 \end{cases}$

6] $\begin{cases} 6x - 2y = 12 \\ 3x - y = 6 \end{cases}$

7] $\begin{cases} 4x + 5y = 12 \\ 6x - 3y = -3 \end{cases}$

Worksheet #7 **NAME** _____
Multiplying Expressions and Factoring

Do **NOT** use a calculator when completing this worksheet. Show work whenever possible.

Find each product. All answers should be in standard form.

1] $3x(x^2 - 4x + 3)$

2] $(x - 8)(x + 7)$

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

4] $(5d + 3)(4d + 7)$

5] $(7x + 4)(7x - 4)$

6] $(w - 5)^2$

7] $(4a + 3)^2$

8] $(-5x + 4)(2x - 9)$

Factor each quadratic expression. Remember to check for common factors. If the expression cannot be factored, so state.

9] $x^2 - 9x + 20$ **10]** $x^2 - 81$ **11]** $x^2 - 13x + 36$

12] $6x^2 - 11x + 4$ **13]** $x^2 + 25$ **14]** $50x^2 - 350x + 300$

15] $4x^2 + 20x + 25$ **16]** $4x^2 - 25$

Worksheet #8 **NAME** _____
Factoring and Solving Quadratic Equations

Do **NOT** use a calculator when completing this worksheet. Show work whenever possible.

Factor each expression. Remember to check for common factors. If the expression cannot be factored, so state.

1] $-4x^2 - 20x$ **2]** $x^2 - 9$ **3]** $x^2 + 7x + 12$

4] $x^2 - x - 42$ **5]** $2x^2 - 11x - 21$ **6]** $x^3 + 6x^2 + 5x$

7] $2x^4 + 9x^3 - 5x^2$

Solve the equation by factoring. Include your algebra and be sure your solutions include statements "x = ." Checking your solutions is advised.

8] $x^2 + 3x - 70 = 0$ **9]** $3x^2 = -30x$ **10]** $x^2 + 8x = 20$

Solve the equation by factoring. Include your algebra and be sure your solutions include statements "x = ." Checking your solutions is advised.

11] $2x^2 + 7x + 3 = 0$ **12]** $6x^2 + 19x + 10 = 0$ **13]** $8x^2 + 2x = 3$

14] $x^2 + 15x - 100 = 0$ **15]** $x^2 - 121 = 0$ **16]** $x^2 + 12x + 36 = 0$

17] $6x^2 - 5x - 6 = 0$

Use the quadratic formula or completing the square to solve the following equations.

18] $x^2 - 4x + 2 = 0$ **19]** $x^2 - 5x - 7 = 0$ **20]** $x^2 + 5x + 7 = 0$

Worksheet #9 **NAME** _____

Exponents and Simplifying Expressions

Do **NOT** use a calculator when completing this worksheet. Show work whenever possible.

Simplify each expression. Your answers cannot include negative exponents. If an expression cannot be simplified, state "simplified now."

1] $c^4 \cdot c^2$ **2]** $\left(n^3\right)^4$ **3]** $\left(-2x^3\right)^3$

4] $\dfrac{-72x}{-9x^3}$ **5]** $\left(\dfrac{x^3}{y^5}\right)^2$ **6]** $\left(\dfrac{-3a^3}{15a^4}\right)$

7] $5\mathrm{m}^{0}$

8] $\left(7\mathrm{a}^{4}\right)\left(-\mathrm{a}^{5}\right)$

9] $\dfrac{1}{\mathrm{n}^{-5}}$

10] $-x^{3}\cdot x^{5}\cdot x$

11] $\mathrm{x}^{5}\cdot\mathrm{x}^{-9}$

12] $\dfrac{3a}{6a^{2}}$

13] $\dfrac{\mathrm{a}^{3}}{\mathrm{b}^{4}}\cdot\dfrac{-\mathrm{b}^{4}}{\mathrm{a}^{3}}$

14] $\dfrac{5\mathrm{a}+7\mathrm{a}}{6}$

15] $\dfrac{3\mathrm{x}}{-6\mathrm{x}^{2}}\cdot 4\mathrm{x}$

Simplify each expression. Your answers cannot include negative exponents. If an expression cannot be simplified, state "simplified now."

16] $x^{2}x^{6}$

17] $\dfrac{x^{7}}{x^{2}}$

18] $\dfrac{x^{-5}y^{3}m^{2}}{x^{2}y^{-8}m^{6}}$

19] $\left(x^{-2}\right)^{3}$

20] $\left(\dfrac{2x^{3}}{3y^{4}}\right)^{2}$

21] $\left(\dfrac{6yx^{6}}{3y^{4}x^{2}}\right)^{4}$

22] $\left(\frac{2x^2}{m^3}\right)^{-2}$

23] $\frac{(a+b)^3}{(a+b)^7}$

24] $\left(3\times10^5\right)^3$

25] $\left(\frac{7x^5y^2}{4x^2y^5}\right)^0$

26] $\left(\frac{a^{-\frac{1}{2}}}{a^{-\frac{2}{3}}}\right)^6$

Worksheet #10 **NAME** _____
Simplifying Radical Expressions

Do **NOT** use a calculator when completing this worksheet. Show work whenever possible.

Simplify each expression, that is, write it in simple radical form. If an expression cannot be simplified, state "simplified now." Answers should be rationalized with no radicals in the denominator.

1] $\sqrt{108}$

2] $\sqrt{80}$

3] $\sqrt{125}$

4] $\sqrt{300}$

5] $\sqrt{15}\cdot\sqrt{10}$

6] $2\sqrt{10}\cdot3\sqrt{5}$

7] $\sqrt{\frac{16}{25}}$

8] $\sqrt{\frac{56}{36}}$

9] $\sqrt{\frac{12}{5}}$

10] $\sqrt{3^2+4^2}$

11] $\sqrt{6}+\sqrt{10}$

12] $\sqrt{8}$

13] $4\sqrt{45}+2\sqrt{20}$

14] $\sqrt{50}-\sqrt{16}+\sqrt{72}$

15] $\sqrt{6}\bullet\sqrt{15}$

Simplify each expression, that is, write it in simple radical form. If an expression cannot be simplified, state "simplified now." Answers should be rationalized with no radicals in the denominator.

16] $4\sqrt{3}\bullet 5\sqrt{27}$

17] $\frac{\sqrt{36}}{\sqrt{25}}$

18] $\frac{5}{\sqrt{3}}$

19] $\frac{\sqrt{7}}{\sqrt{2}}$

20] $\frac{\sqrt{6}}{\sqrt{12}}$

21] $\frac{4}{1+\sqrt{3}}$

22] $\frac{8}{2-\sqrt{2}}$

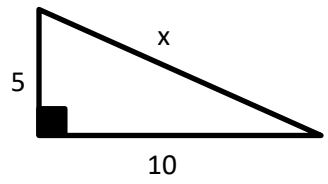
23] $\frac{10}{5-\sqrt{5}}$

Worksheet #11 **NAME** _____

Pythagorean Theorem and Right Triangle Trig

Solve for x in each of the following right triangles. Find exact answers. Show work whenever possible.

1]



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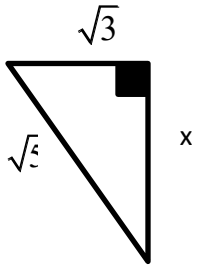

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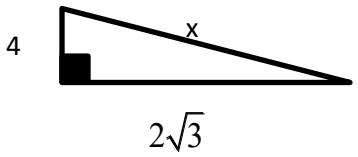

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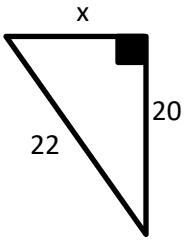

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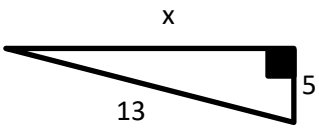

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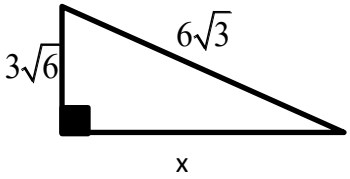

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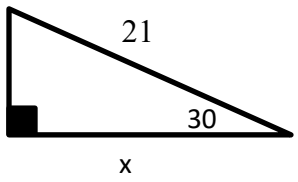

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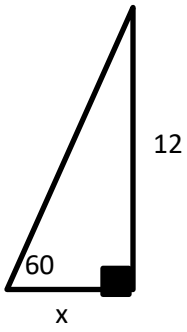

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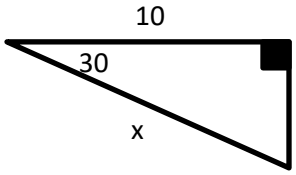

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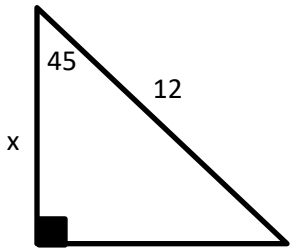

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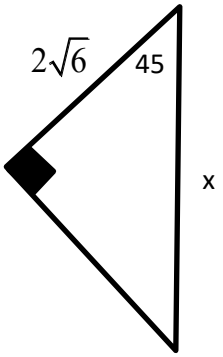

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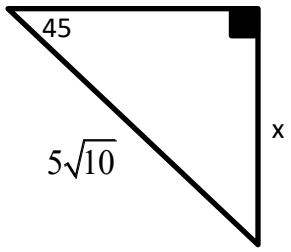
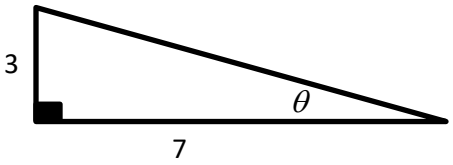
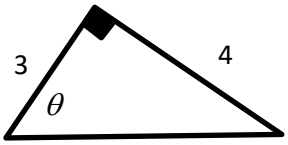


Using the given right triangle and without a calculator find the following trig ratios.

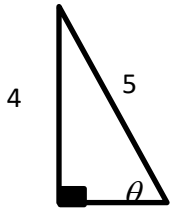
13] Solve for $\sin\theta$**.**



14] Solve for $\tan\theta$**.**



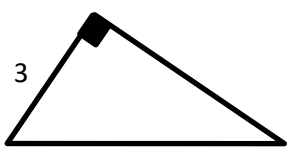
15] Solve for $\cos\theta$**.**



Using the given right triangle and a calculator find the measure of θ to the nearest hundredth of a degree.

16]

17]



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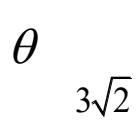


WORKSHEET ANSWERS

Worksheet #1 Answers:

1] $\frac{1}{13}$ **2]** $\frac{4}{5}$ **3]** $\frac{9}{8}$ **4]** $\frac{17}{14}$ **5]** $-\frac{11}{8}$ **6]** $\frac{7}{2}$ **7]** $\frac{3}{2}$ **8]** $\frac{9}{4}$

9] $\frac{3}{10}$ **10]** $-\frac{1}{10}$ **11]** $\frac{21}{4}$ **12]** $\frac{2}{3}$ **13]** $\frac{13}{8}$

Worksheet #2 Answers:

1] -33 **2]** 2 **3]** -40 **4]** 198 **5]** $-y^2+12y$ **6]** $-4x^2-6x+2$ **7]** $-13x+7$ **8]** $3x-10$

9] 1 **10]** always negative **11]** always negative **12]** always positive

Worksheet #3 Answers:

1] $\frac{100}{3}$ **2]** $\Re$ (all real numbers) **3]** $-\frac{10}{3}$ **4]** 4 **5]** –4 **6]** 7 **7]** –24

8] –8 **9]** $\varnothing$ (no solution) **10]** $\frac{2}{17}$

Worksheet #4 Answers:

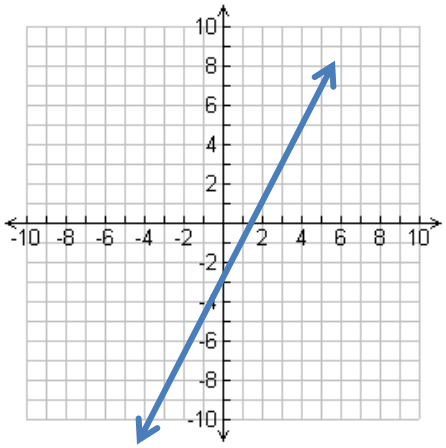
1] $y = 5(1+\frac{2}{3}x),\ y = \frac{35}{3}$ **2]** $y = 4x - 36,\ y = -28$ **3]** $\ell = \frac{p-2w}{2}$ **4]** $h = \frac{LA}{2\pi r}$ **5]** $w = \frac{3V}{\ell \bullet h}$

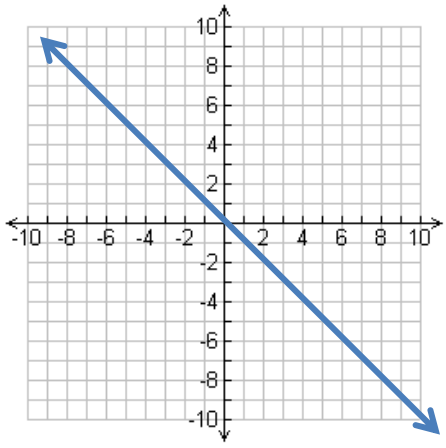
6] $F = \frac{9}{5}C + 32$ **7]** $b_1 = \frac{2A}{h} - b_2$ **8]** $t = \frac{PV}{nr}$ **9]** $\ell = \sqrt{d^2 - w^2 - h^2}$ **10]** $P = \frac{I}{(1+r)^t}$

Worksheet #5 Answers:

1] $m = \frac{2}{3}$ **2]** $m = undefined$ **3]** $y = 5x + 2$ **4]** $y = -4x - 9$ **5]** $y = -2x - 6$ **6]** $y = -2x + 17$

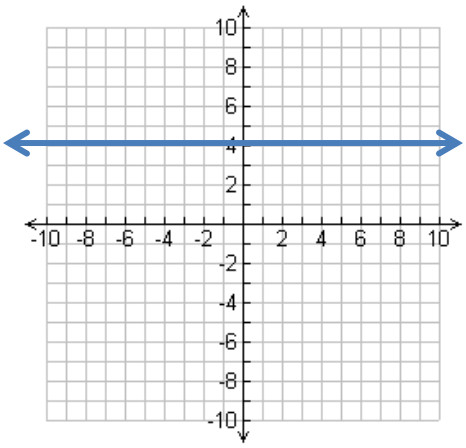
7] $y = 2x - 3$ **8]** $y = -x$

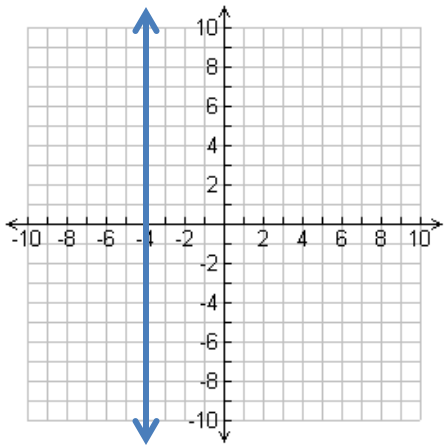


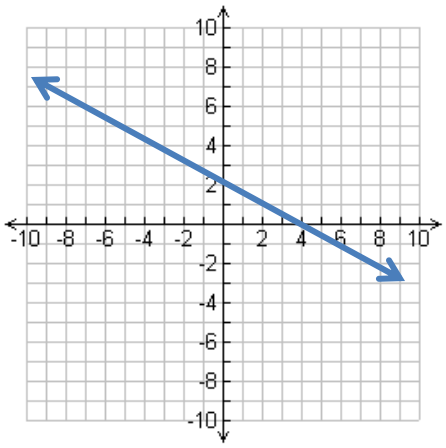


Worksheet #5 Answers (con't):

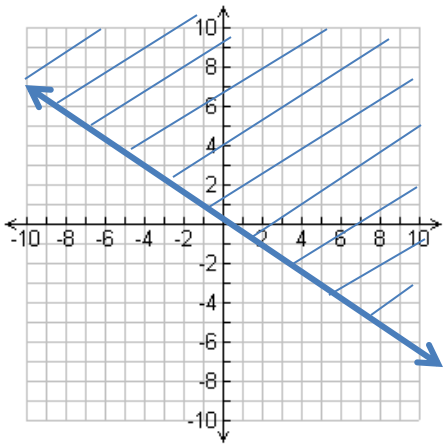
9] $y = 4$ **10]** $x = -4$ **11]** $2x + 4y = 8$



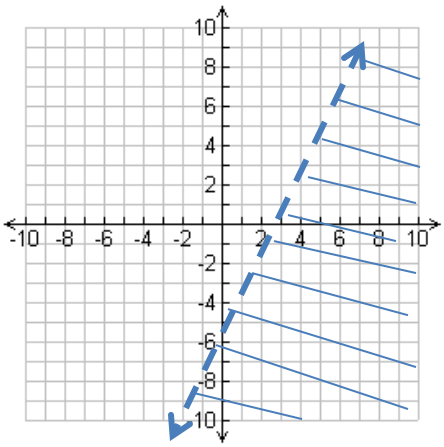




12] $y \geq -\frac{2}{3}x$



13] $4x-2y>12$



Worksheet #6 Answers:

1] $(2,5)$ **2]** infinitely many solutions **3]** $\varnothing$ (no solution) **4]** $(3,7)$ **5]** $\varnothing$ (no solution)

6] infinitely many solutions **7]** $\left(\frac{1}{2},2\right)$

Worksheet #7 Answers:

1] $3x^3-12x^2+9x$ **2]** x^2-x-56 **3]** $4x^2-9$ **4]** $20d^2+47d+21$ **5]** $49x^2-16$ **6]** $w^2-10w+25$

7] $16a^2+24a+9$ **8]** $-10x^2+53x-36$ **9]** $(x-5)(x-4)$ **10]** $(x-9)(x+9)$ **11]** $(x-9)(x-4)$

12] $(3x-4)(2x-1)$ **13]** cannot be factored **14]** $50(x-6)(x-1)$ **15]** $(2x+5)^2$ **16]** $(2x-5)(2x+5)$

Worksheet #8 Answers:

1] $-4x(x+5)$ **2]** $(x+3)(x-3)$ **3]** $(x+3)(x+4)$ **4]** $(x-7)(x+6)$ **5]** $(2x+3)(x-7)$

6] $x(x+5)(x+1)$ **7]** $x^2(2x-1)(x+5)$ **8]** $x=7;\ x=-10$ **9]** $x=0;\ x=-10$ **10]** $x=2;\ x=-10$

11] $x=-3;\ x=-\frac{1}{2}$ **12]** $x=-\frac{5}{2};\ x=-\frac{2}{3}$ **13]** $x=-\frac{3}{4};\ x=\frac{1}{2}$ **14]** $x=-20,5$ **15]** $x=\pm 11$

16] $x=-6$ **17]** $x=-\frac{2}{3},\frac{3}{2}$ **18]** $x=2\pm\sqrt{2}$ **19]** $\frac{5\pm\sqrt{53}}{2}$ **20]** $\varnothing$ (no solution)

Worksheet #9 Answers:

1] c^6 **2]** n^{12} **3]** $-8x^9$ **4]** $\frac{8}{x^2}$ **5]** $\frac{x^6}{y^{10}}$ **6]** $-\frac{1}{5a}$ **7]** 5 **8]** $-7a^9$ **9]** n^5 **10]** $-x^9$ **11]** $\frac{1}{x^4}$ **12]** $\frac{1}{2a}$

13] -1 **14]** $2a$ **15]** -2 **16]** x^8 **17]** x^5 **18]** $\frac{y^{11}}{x^7 m^4}$ **19]** $\frac{1}{x^6}$ **20]** $\frac{4x^6}{9y^8}$ **21]** $\frac{16x^{16}}{y^{12}}$ **22]** $\frac{m^6}{4x^4}$

23] $\frac{1}{(a+b)^4}$ **24]** 2.7×10^{16} **25]** 1 **26]** a

Worksheet #10 Answers:

1] $6\sqrt{3}$ **2]** $4\sqrt{5}$ **3]** $5\sqrt{5}$ **4]** $10\sqrt{3}$ **5]** $5\sqrt{6}$ **6]** $30\sqrt{2}$ **7]** $\frac{4}{5}$ **8]** $\frac{\sqrt{14}}{3}$ **9]** $\frac{2\sqrt{15}}{5}$ **10]** 5

11] simplified now **12]** $2\sqrt{2}$ **13]** $16\sqrt{5}$ **14]** $11\sqrt{2}-4$ **15]** $3\sqrt{10}$ **16]** 180 **17]** $\frac{6}{5}$ **18]** $\frac{5\sqrt{3}}{3}$

19] $\frac{\sqrt{14}}{2}$ **20]** $\frac{\sqrt{2}}{2}$ **21]** $-2+2\sqrt{3}$ **22]** $8+4\sqrt{2}$ **23]** $\frac{5+\sqrt{5}}{2}$

Worksheet #11 Answers:

1] $5\sqrt{5}$ **2]** $\sqrt{2}$ **3]** $2\sqrt{7}$ **4]** $2\sqrt{21}$ **5]** 12 **6]** $3\sqrt{6}$ **7]** $\frac{21\sqrt{3}}{2}$ **8]** $4\sqrt{3}$ **9]** $\frac{20\sqrt{3}}{3}$ **10]** $6\sqrt{2}$

11] $4\sqrt{3}$ **12]** $5\sqrt{5}$ **13]** $\frac{3\sqrt{58}}{58}$ **14]** $\frac{4}{3}$ **15]** $\frac{3}{5}$ **16]** $23.20°$ **17]** $45°$ **18]** $53.13°$