# Algebra II Honors – Summar Assignment

Algebra II Honors – Summer Assignment

**Directions: Complete the exercises below WITHOUT the use of a calculator.  Make sure to show all of work, neatly!**

**I.** State the domain and range of each relation.  Then determine whether each relation is a function; *explain* your reasoning.

| a) $\{(4,5),\ (5,-1),\ (0,12),\ (0,-2),\ (7,9)\}$ | b) |
|---|---|
| |  |
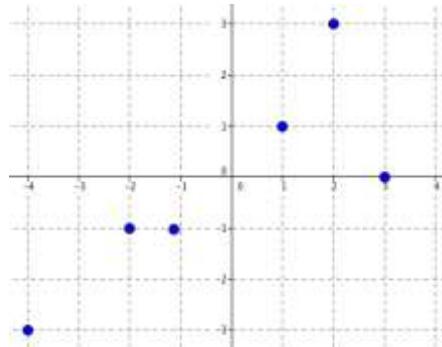
**II.** Name the quadrant in which each point is located.

| a) (-3, 7) | b) (10, -11) | c) (0, 5) | d) $\left(\dfrac{42}{5}, 6\div\right)$ |
|---|---|---|---|

**III.** Find the product.

| a) $(2x+9)(x+1)$ | b) $(5x-1)(6x-10)$ | c) $(3x^2-4)(3x^2+4)$ |
|---|---|---|

**IV.** The height of a rectangle is 3 units less than twice the width.

| a) If the width of the rectangle is represented by the variable w, write an expression for the height in terms of w. | b) Write an expression for the area of the rectangle in terms of w. |
|---|---|

**V.** Factor each polynomial completely.

| | | |
|---|---|---|
| a) $4x^2+12x^7$ | b) $81x^2-36$ | c) $x^2-16x+63$ |
| d) $x^2-7x-18$ | e) $25x^2-20x+4$ | f) $2p^3+5p^2+6p+15$ |
| g) $12x^8y^{12}-75x^6y^{16}$ | h) $4x^2-7x-15$ | i) $x^2+40x+400$ |
| j) $3n^3-4n^2+9n-12$ | k) $12a^4b-18a^3b^2+24ab^5$ | l) $x^2+x+0.25$ |
| m) $4x^3+43x^2+30x$ | n) $4x^2-x-5$ | o) $4x^2+4xy+y^2$ |
| p) $x^4-1$ | q) $5(x-3)^3+2(x-3)^2$ | r) $25-x^2$ |
| s) $81a^2+198ab+121b^2$ | t) $7x^2-32x-60$ | u) $12xy-28x-15y+35$ |

**VI.** Find the measure of x.

x in

18 in

30 in
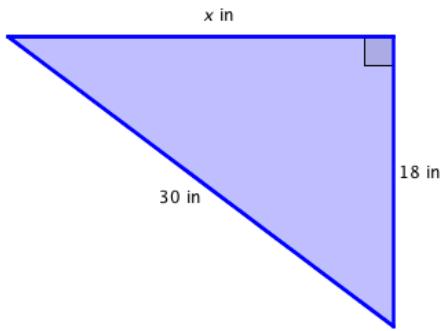
**VII.** The lengths of three sides of a triangle are given. Determine whether each triangle is a right triangle. Show the work that leads to your conclusion.

| a) 6, 8, 12 | b) 9, 12, 15 |
|---|---|

**VIII.** Complete each statement for the given property.

| |
|---|
| a) Commutative Property of Addition: $a + b$ = _____ |
| b) Commutative Property of Multiplication: $a \cdot b$ = _____ |
| c) Associative Property of Addition: $(a + b) + c$ = _____ |
| d) Associative Property of Multiplication: $(a \cdot b) \cdot c$ = _____ |
| e) Additive Inverse of Addition: $a$ _____ = _____ |
| f) Multiplicative Inverse: $a$ _____ = _____ |

**IX.** Solve.

| a) $|9x + 4| - 11 = -4$ | b) $|7x + 2| - 8 = -15$ | c) $-|3x + 4| = 5x + 4$ |
|---|---|---|
| d) $\dfrac{3x+14}{5} > 8 - 2x$ | e) $-8 < \dfrac{1}{2}(6x - 10) \le 13$ | |
| f) $|-4x - 3| \ge 11$ | g) $6 > |7x - 5|$ | |

**X.** Evaluate each expression if $a = \dfrac{3}{4}$, $b = -8$, $c = -\dfrac{1}{2}$, $d = 3$, $f = -\dfrac{1}{3}$

| a) $ab^2 - d$ | b) $\dfrac{ab}{c} + d^2$ |
|---|---|

**XI.** Solve.

| a) | b) | c) |
|---|---|---|
| $-2\left(\dfrac{1}{4}x - \dfrac{2}{3}\right) + \left(\dfrac{1}{2}x + \dfrac{3}{4}\right) = 5(3x - 6)$ | $\dfrac{2}{3}\left(4x - 5\right) = \dfrac{1}{4}\left(7 - 3x\right)$ | $3 - \dfrac{1}{5}\left(x - 8\right) = 3x - \left(\dfrac{x}{4} + 6\right)$ |

**XII.** Fill in the blanks.

| |
|---|
| a) Two lines are parallel |
| if:_____. |
| b) Two lines are perpendicular if: |
| _____. |

c) To find an x-intercept: _____.

d) To find an y-intercept: _____.

## XIII. Sketch the graph.

| | |
|---|---|
| a) $y = 3x + 5$ | b) $y = \dfrac{x}{2} - 3$ |
| c) $4x - 3y = 12$ | d) $y - 1 = -4(x + 5)$ |
| e) $y = 7$ | f) $x = 7$ |
| g) $y = |x + 2| - 3$ | h) $y = |x - 4| + 1$ |
| i) $3x + 7y < -21$ | j) $y \ 3 \ |x + 1| + 6$ |

## XIV. Write the equation of a line in *standard form* with the given characteristics.

| |
|---|
| a) Passes through (6, 1) and is perpendicular to the line $3x - 4y = 2$. |
| b) Has an x-intercept of (9, 0) and a y-intercept of (0, -3). |
| c) Passes through the point (4, 7) and is parallel to the line that passes through the points (-1, 8) and (5, -6). |

## XV. Solve each system.

| a) $3x - 6y = 2$ <br> $5x + 4y = 1$ | b) $2x + y = 1$ <br> $4x + 2y = 3$ |
|---|---|
| c) $x + 2y = 4$ <br> $2x + 4y = 8$ | d) $\dfrac{x}{3} - \dfrac{y}{4} = 1$ <br> $\dfrac{x}{2} - \dfrac{y}{3} = -2$ |

## XVI. Solve the system of inequalities by graphing.

| a) $y < 2x - 3$ <br> $y \geq 4$ | b) $y > 2$ <br> $y \leq -2$ <br> $x > 3$ | c) $y \leq -|x + 1| + 4$ <br> $y > 2$ |
|---|---|---|

## XVII. Simplify. Your answer should contain only positive exponents.

| a) $\left(2x^4\right)^{-3} \times 2x^4$ | b) $\dfrac{2x^2 y^4 \times 4x^2 y^4 \times 3x}{3x^{-3} y^2}$ | c) $\dfrac{\left(2pm^{-1}q^0\right) \times 2m^{-1}p^3}{2pq^2}$ |
|---|---|---|

## XVIII. State the quadratic equation.

## XIX. Solve the quadratic equation.

| a) $9x^2 + 10 = 91$ | b) $3x^2 - 16x = 12$ | c) $3x^2 - 12x - 3 = -x^2$ |
|---|---|---|