

## Algebra II-4 Summer Work - Prerequisite Skills Review

### Skills Practice #1 – Evaluating Expressions

Evaluate each expression for the given value of the variable.

1.  $\frac{y-(y-x)}{2} - z$ , for  $x = -2, y = 4, z = 1$

2.  $(m)(m + |p - 1|)$ , for  $m = -8, p = 4$

### Skills Practice #2 – Finding x-intercept(s) and y-intercept

Find the x-intercept and y-intercept of each function.

3.  $y = 2x + 3$

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

### Skills Practice #3 – Fractions

Simplify the following fractions. Answers can be left as improper fractions.

5.  $\left(\frac{5}{7} \div \frac{1}{14}\right) + \left(2 \cdot \frac{11}{3}\right)$

6.  $\left(\frac{3}{5} \div 3\right) - \left(6 \cdot \frac{4}{8}\right)$

7.  $\frac{-\frac{4}{7}}{\frac{8}{-3}}$

8.  $4\frac{1}{2} + \frac{9}{10} - 1\frac{5}{8} - 2$

### Skills Practice #4 – Adding, Subtracting, and Multiplying Polynomials.

Leave your answer in standard form.

9.  $(7n^3 + n^4 + 7) + (3n^4 + 11 - 3n^5)$

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

11.  $5x(x + 1) - 3x(x + 1)$

12.  $(x + 6)(x - 3)$

13.  $(2x + y)(3x - 4y)$

14.  $(6\sqrt{2} - 3)(6\sqrt{2} + 3)$

15.  $(2m - 6)^2$

16.  $(6n - 3)(6n + 3)$

17.  $(3x^3 + y^2)(2x + y)$

18.  $(2x + 7)^2$

19.  $(2x - 10)^2$

20.  $(x + 2)^3$

21.  $5z - [3z - (10z + 8)]$

22.  $(3x - 7)^2$

23.  $(7x^4 - 2x^3 + 5x^2) + (7x^3 - 2x^2 + 5) - (6x^3 + 2x^2 - 12x)$

**Skills Practice #5 – Factoring****Factor these expressions completely.**

24.  $z^2 - 5z - 24$

25.  $5x^2 + 26x + 5$

26.  $4x^3 - 8x^2 + 12x$

27.  $x^2 - 13x + 42$

28.  $25y^2 - 10y + 1$

29.  $6x^2 - 54$

30.  $25x^2 - 9$

31.  $2x^2 + 4x - 2x^3$

32.  $49 - 9y^2$

33.  $12v^3 - 147v$

**Skills Practice #6 – Properties of Exponents****Simplify these expressions, with no negative exponents in your answer.**

34.  $\frac{(2^3)^2 \cdot 2^3}{(2^{-1})^0}$

35.  $10x^7 \cdot 3x^4$

36.  $x^3y^3(4xy^2)^3$

37.  $\frac{3x^2y^3z}{x^2y}$

38.  $\left(\frac{y^{-5}}{y^9}\right)^{-4}$

39.  $\left(\frac{2x^{-5}y^{12}}{3x^{-14}y^8}\right)^{-6}$

**Skills Practice #7 – Radicals****Simplify these expressions into simplest radical form (i.e., no perfect square divisors of the radicand, no fractions in radicand, and no radicals in the denominator).**

40.  $\sqrt{175}$

41.  $\sqrt{24}$

42.  $\sqrt{252}$

43.  $\frac{5}{\sqrt{2}}$

44.  $\frac{3}{\sqrt{32}}$

45.  $\sqrt{\frac{10}{13}}$

**Skills Practice #8 – Polynomials Terminology****What is the degree and leading coefficient of the following?**

46.  $-5 + 2x^2 - 3x^4$

47.  $6x^3 + 4x^5 - 1 - x$

### Skills Practice #9 – Distance and Midpoint Formulas

What is the length and midpoint of the segment connecting each pair of points? Express lengths in simplest radical form.

48.  $(-8, 6), (-2, -5)$

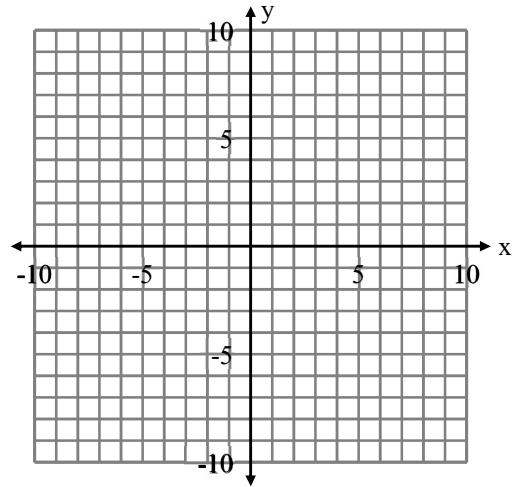
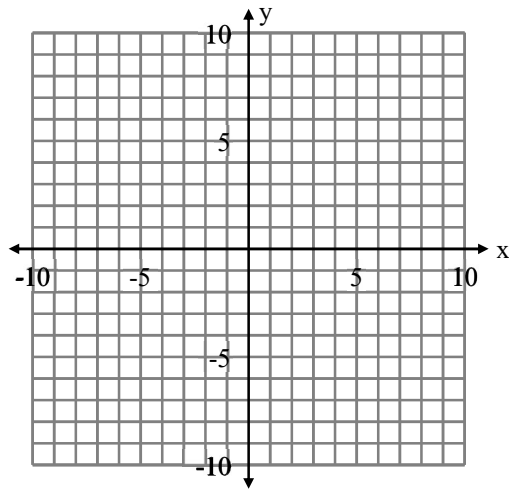
49.  $(7, -1), (-9, 10)$

### Skills Practice #10 – Graphing Equations

Without using a graphing calculator, graph the following equations, in which  $y$  is a function of  $x$ .

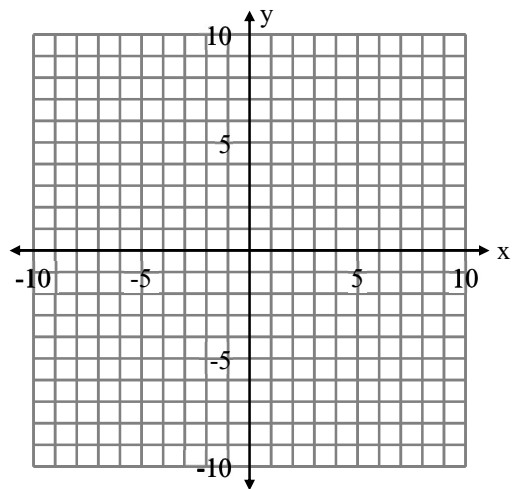
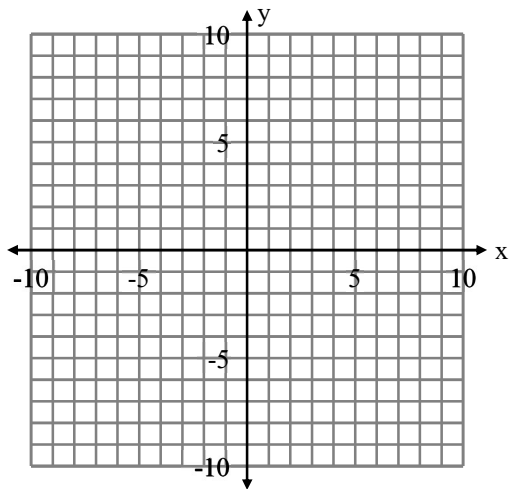
50.  $y = \frac{3}{2}x - 1$

51.  $y = x$



52.  $y + 2 = \frac{-2}{5}(x - 3)$

53.  $2x + 5y = 13$



### Skills Practice #11 – Equations of Lines

Find the equation of the line with the given properties. Express your answer in point-slope form, slope-intercept form (if possible) and standard form.

54. Through  $(4,2)$  and  $(0,-1)$

55. Through  $\left(-\frac{1}{2}, \frac{3}{2}\right)$  with a slope of  $-3$ .

56. Through  $(2,1)$  with a slope of  $0$

57. Through  $(-8,1)$  with slope undefined

### Skills Practice #12 – Solving Quadratic Equations

12A. Solve these equations by factoring

58.  $9x^2 - 1 = 0$

59.  $16x^2 + 56x = -49$

60.  $2x^2 + 4x = x^2 + 12$

61.  $-2x^2 - 4x + 3 = -3x^2$

12B. Solve these equations by using the quadratic formula.

Express your answer in simplest radical form. (SRF)

62.  $25x^2 - 20x + 3 = 0$

63.  $16x^2 + 5 = 40x$

64.  $\frac{x-9}{7} = \frac{-2}{x}$

### Skills Practice #13 - Solving Equations

Solve these equations.

65.  $\frac{100-4u}{3} = \frac{5u+6}{4} + 6$

66.  $\frac{3}{2}(z+5) - \frac{1}{4}(z+4) = 0$

$$67. \frac{2}{3}(x-1) + \frac{1}{4}x = 10$$

$$68. 6[x - (2x + 3)] = 8 - 5x$$

$$69. \frac{5x}{4} + \frac{1}{2} = x - \frac{3}{2}$$

$$70. \frac{x-3}{2} = \frac{x+4}{5}$$

$$71. A = P + Ptr; \text{ solve for } P$$

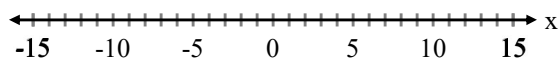
$$72. A = \frac{1}{2}(a+b)h; \text{ solve for } b$$

$$73. 6x + ax = 2x + 5; \text{ solve for } x$$

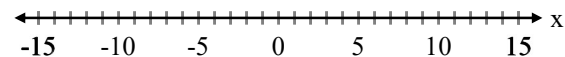
### Skills Practice #14 – Solving and Graphing Inequalities

Solve these inequalities and graph the solution set on the number line.

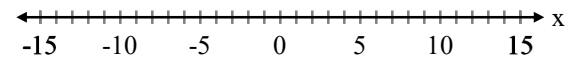
$$74. -4 < \frac{2x-3}{3} < 4$$



$$75. |x-7| < 6$$



$$76. 2|x+10| \geq 10$$



**Skill Practice #15 – Basic Word Problems**

**Solve these problems using algebraic equations. Be sure to define your variables.**

77. The sum of three consecutive natural numbers is 804. Find the numbers.

78. One positive number is five times another number. The difference between the two numbers is 148. Find the numbers.

79. Liz's school is selling tickets to the annual dance competition. On the first day of ticket sales the school sold 4 adult tickets and 2 child tickets for a total of \$34. The school took in \$108 on the second day by selling 8 adult tickets and 12 child tickets. Find the price of an adult ticket and the price of a child ticket.

80. The price of a swimming pool has been discounted 16.5%. The sale price is \$1,210.75. Find the original list price of the pool.

81. What is 175% of 360.

82. 459 is what percent of 340?

83. 70 is 40% of what number.