

**Incoming Academic Pre-Calculus**

**Summer Work Packet**

**2017-2018**

NAME: \_\_\_\_\_

Please complete this review packet for the **FIRST DAY OF CLASS**.

The problems included in this packet will provide you with the opportunity to practice the mathematical skills you have learned throughout the current school year and will help you to be prepared for the concepts you will learn in Pre-Calculus. You are responsible for ALL the concepts covered in the packet. The packet will count as a quiz score for the first marking period.

Please **DO NOT** use a calculator. Please show all work.

You may use [khanacademy.com](http://khanacademy.com) or [flippedmath.com](http://flippedmath.com) for assistance. You may also use your Algebra II notes and Canvas notes.

**Simplify.**

1.  $8(y^2 - x) - 3(3x - 6y^2)$

2.  $\frac{1}{6}(18 - 3x) - \frac{5}{6}(12x + 24)$

**Evaluate the following expression for the given value(s). Reduce to lowest terms if possible.**

3.  $\frac{7(x^2 + 8) - (x - 4)}{16x + 8}, \quad x = -2$

**Simplify the polynomial. Then state degree and type.**

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

5.  $(3y^2 - 6)^2$

**Simplify each expression. Use only positive exponents.**

6.  $(x^2y^3)(2xy^5)$

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

**Factor each polynomial.**

8.  $x^2 + 20x + 36$

9.  $x^2 - x - 30$

10.  $2x^3 + 8x^2 + 5x + 20$

11.  $25x^2 - 144y^4$

12.  $5x^2 - 16x + 3$

13.  $6x^2 + 25x + 14$

14.  $a^4b^5 - a^2b^9$

15.  $x^2 + 2xy - 8y^2$

16.  $27x^3 + 125y^9$

**Simplify each rational expression and state the domain.**

17.  $\frac{6x-24}{3x-12}$

18.  $\frac{x^2-6x-16}{x^2-5x-24}$

19.  $\frac{1-\frac{y^2}{x^2}}{1+\frac{y}{x}}$

**Evaluate.**

20.  $25^{\frac{-3}{2}}$

21.  $27^{\frac{2}{3}}$

22.  $9^{-2}$

23.  $2 \cdot 9^{\frac{3}{2}}$

24.  $\frac{\left(-8x^{\frac{3}{2}}\right)^{\frac{1}{3}}}{\left(16x^{\frac{1}{2}}\right)^{\frac{3}{2}}}$

Solve.

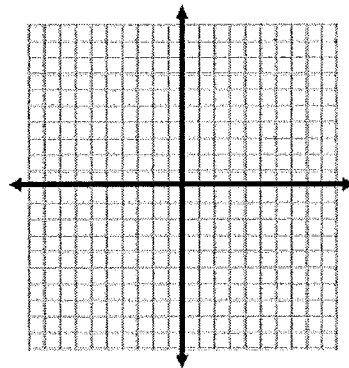
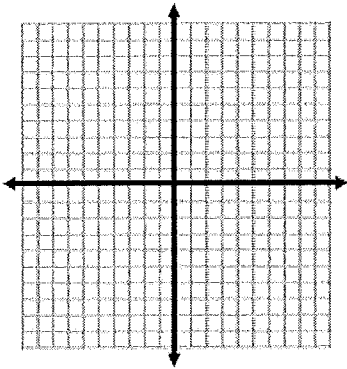
25.  $3x - 7(2x - 13) = 3(-2x + 9) + 4$

26.  $2x + y = 10$     $2y = 4x - y$

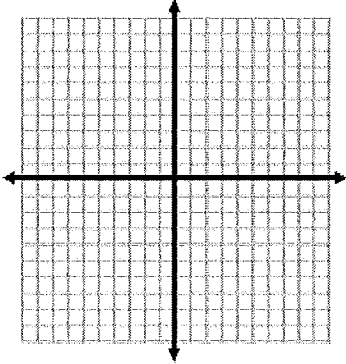
For each of the following, list your transformations, dot in the parent function and sketch the graph.

27.  $y = -\frac{1}{2}\sqrt{x-4}$

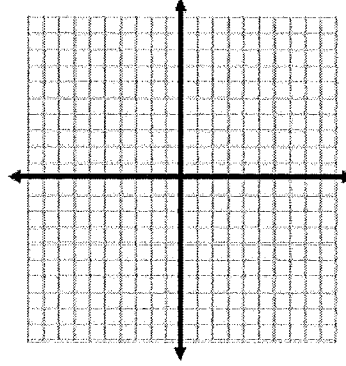
28.  $y = 3\sqrt[3]{x} + 4$



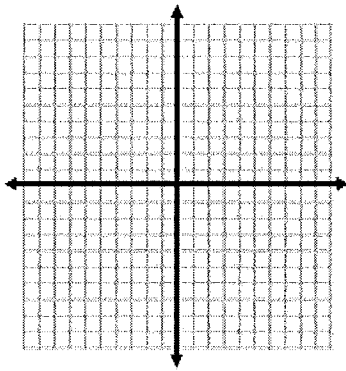
29.  $y = (x+2)^2 + 4$



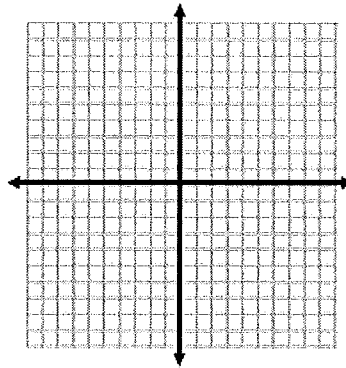
31.  $f(x) = -|x-4| - 6$



30.  $f(x) = -2(x+3)^2 + 5$

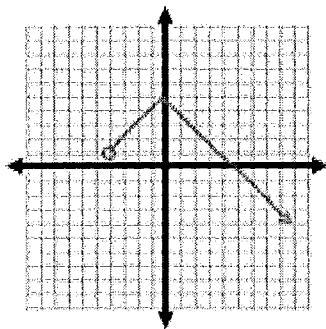


32.  $f(x) = \frac{1}{3}(x+4)^3$



State the domain and range

33.



34. Rewrite  $-x^2 + y = 12$  in function notation and evaluate at  $f(-3)$  and  $f(x + 2)$ .

35. If  $f(x) = -3x + 2$  and  $g(x) = x^2 + 2$ , find:

a)  $(g \circ f)(4)$

b)  $(f \circ f)(3)$

c)  $(f \circ g)(x)$

d)  $(g \circ f)(x)$

36. Solve the quadratic equation by factoring:

a)  $5x^2 - 13x + 6 = 0$

b)  $x^2 + 2x - 15 = 0$

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

d)  $25x^2 - 144 = 0$

37. Solve the quadratic equation by completing the square:

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

b)  $4x^2 - 40x + 84 = 0$

38. Solve the quadratic equation using the quadratic formula:

a)  $x^2 + 2x + 12 = 0$

b)  $2x^2 - 4x = 15$



39. Solve the quadratic equation by taking square roots:

$$-4x^2 - 80 = 0$$

40. An object is launched directly upward at 110 feet per second (ft/s) from a platform 75 feet high.

a. When will the object be 120 feet high?

b. What is its maximum height?

c. When will it reach the ground?