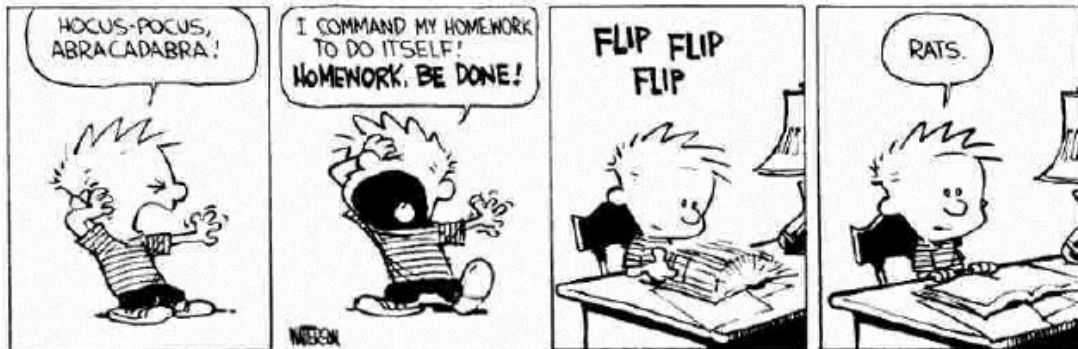


# FOR ALL STUDENTS TAKING PRE-CALCULUS

## 2018-2019 SUMMER REVIEW PACKET

Due 1st Day of School



Name \_\_\_\_\_

## Pre-Calculus Summer Assignment Information

Welcome to Pre-Calculus! This summer review assignment is designed to refresh your Algebra 2 and Trigonometry skills. It includes information that was taught in Algebra 2 and/or Trig and will be used daily in Pre-Calculus.

**Assignment Requirements:** You **MUST** show all work in order to receive credit! This includes the multiple choice problems. All work must be done on the attached answer sheets in a neat and organized manner. No work, no credit! Please show work and respond to Part 1 in the space provided. For Part II, please write your multiple choice answers on the answer sheet that has been provided in this packet.

**Due Date:** This packet must be completed by the 1st day of school. 15 % will be deducted for each day that this packet is late.

**Grading:** This assignment will be collected and graded based upon completion and correctness. It will count as your first **test grade** for Quarter 1. You will have an opportunity to ask questions during the first couple of days of school. A quiz covering the material will be given during the first week of school. These topics also tie in with the first few units of Pre-Calculus.

**About Pre-Calculus:** Pre-Calculus is a rigorous and fast-paced course. This standards based year-long course emphasizes the use and application of polynomial, logarithmic, and trigonometric functions and their applications, the extension of conic sections and the concept of theory of limits. **There will be extensive use of the graphing calculator, which is required for this course. A TI-84 Plus calculator is recommended and will be used by the instructor during lessons throughout the year.**

**Be prepared for at least a half hour to an hour and a half of homework each night with weekly quizzes and/or tests. An extensive project may be assigned each term.**

**Helpful Websites:** If you need help with any of the problems, refer to the following websites:

[www.glencoe.com](http://www.glencoe.com)

[www.wolframalpha.com](http://www.wolframalpha.com)

[www.regentsprep.org](http://www.regentsprep.org)

[www.purplemath.com/modules](http://www.purplemath.com/modules)

[www.Aleks.com](http://www.Aleks.com) (a website where you can subscribe for individual math lessons)

[www.khanacademy.org](http://www.khanacademy.org)

[www.google.com](http://www.google.com)

[www.youtube.com](http://www.youtube.com)

## PART I

Define the following.

1. Integer

2. Rational Numbers

3. Irrational Numbers

4. Domain

5. Range

6. Interval

7. Linear

8. Absolute Value

9. Conjugate

10. Function

11. Independent

12. Dependent

13. Polynomial

14. Parabola

15. Vertex

16. Vertical Asymptote

17. Horizontal Asymptote

18. Maximum and Minimum Points

19. Roots, Zeros, X-Intercepts, Solutions

20. Axis of Symmetry

21. Continuous Function 22. Inverse

23. Transformations

## Everything you need to know about Linear Functions

1. What is the Standard Form of a Linear Equation? \_\_\_\_\_
2. What is Slope-Intercept Form of a Linear Equation? \_\_\_\_\_
3. What is Point-Slope Form of a Linear Equation? \_\_\_\_\_

### Graphing Linear Equations

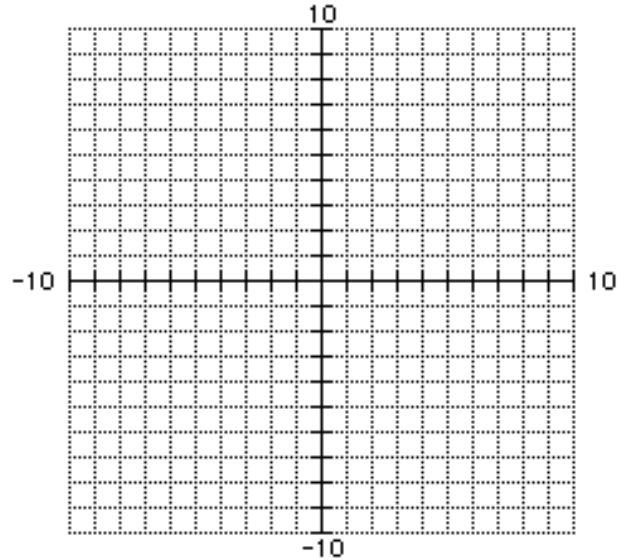
4. Graph the Linear Parent Function:  
\_\_\_\_\_ in red and the function  $y = \frac{2}{3}x - 6$   
in pencil.

5. Identify the domain and range of both functions.

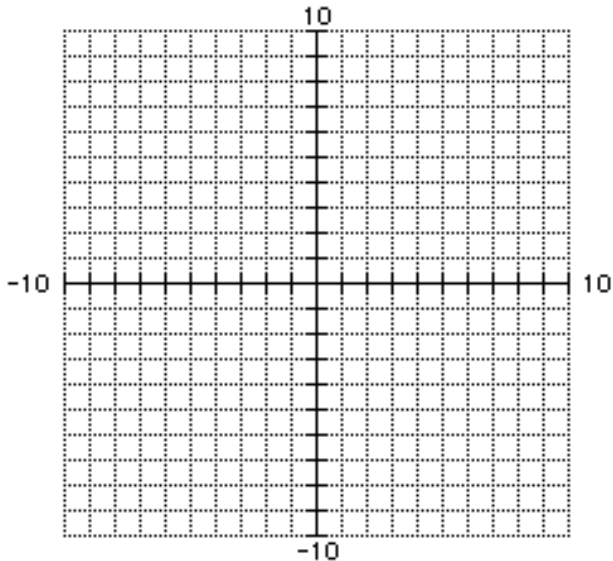
Parent: \_\_\_\_\_  $y = \frac{2}{3}x - 6$

Domain: \_\_\_\_\_ Domain: \_\_\_\_\_

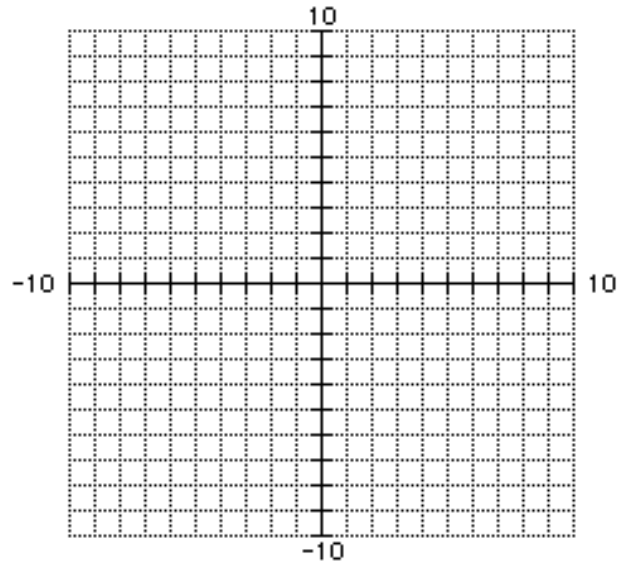
Range: \_\_\_\_\_ Range: \_\_\_\_\_



6. Graph  $5x + 2y = 10$



7. Graph  $2x - y = 5$



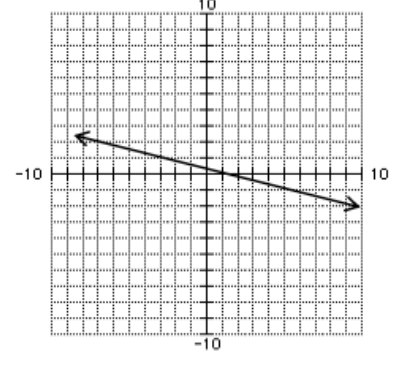
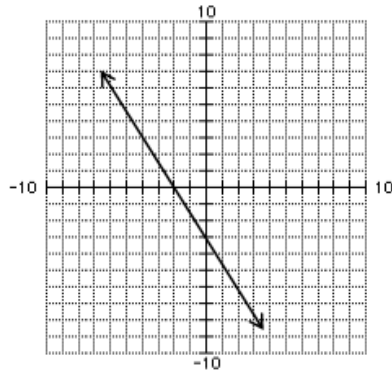
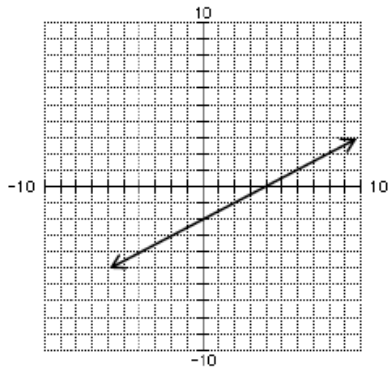
### Writing Linear Equations

8. Parallel Lines have \_\_\_\_\_ slope.

9. Perpendicular Lines have \_\_\_\_\_ slope.

10. Write the equation of each line in Slope -Intercept Form.

a) \_\_\_\_\_ b) \_\_\_\_\_ c) \_\_\_\_\_



11. Find the slope-intercept form of the line that passes through (2, 3) and (1, 5).

12. Write the standard form of the equation of the line that passes through (3, 2) and is parallel to the line whose equation is  $y = 2x + 5$ .

13. Write the standard form of the equation of the line that passes through (3, 2) and is perpendicular to the line whose equation is  $y = 2x + 5$ .

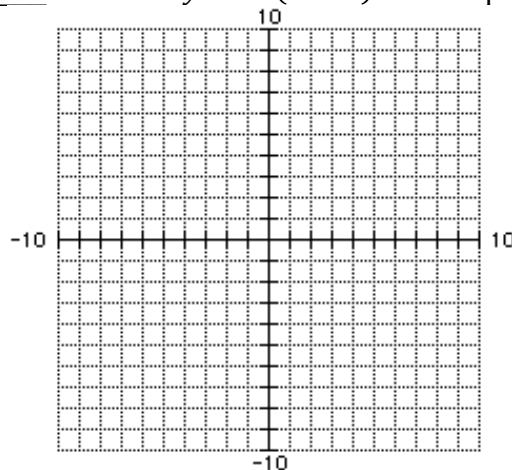
## Everything you need to know about Quadratic Functions

14. What is the Standard Form of a Quadratic Equation? \_\_\_\_\_  
 15. What is General (Vertex) Form of a Quadratic Equation? \_\_\_\_\_

### Graphing Quadratic Equations

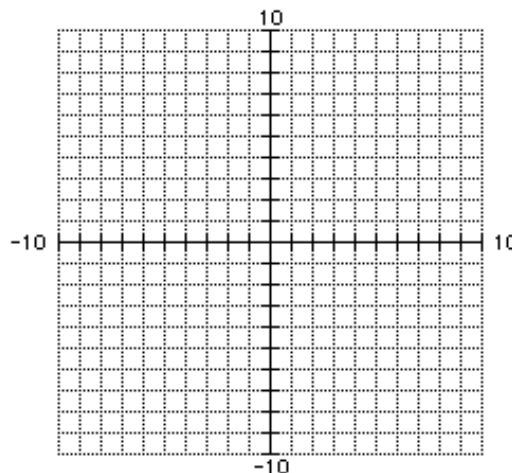
16. Graph the Quadratic Parent Function: \_\_\_\_\_ in red and  $y = -(x + 2)^2 + 3$  in pencil.  
 17. Identify the domain and range of both functions.

Parent: \_\_\_\_\_  $y = -(x + 2)^2 + 3$   
 Domain: \_\_\_\_\_ Domain: \_\_\_\_\_  
 Range: \_\_\_\_\_ Range: \_\_\_\_\_



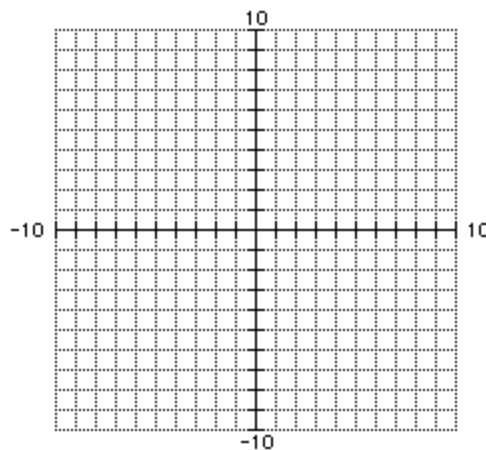
18. Graph the equation  $y = 4(x + 2)^2 - 3$   
 Identify the following parts of the parabola.

Vertex: \_\_\_\_\_  
 Axis of Symmetry: \_\_\_\_\_  
 Direction: \_\_\_\_\_  
 x-intercepts: \_\_\_\_\_  
 x-intercepts: \_\_\_\_\_  
 Domain: \_\_\_\_\_  
 Range: \_\_\_\_\_



18. Graph the equation  $y = 4(x + 2)^2 - 3$   
 Identify the following parts of the parabola.

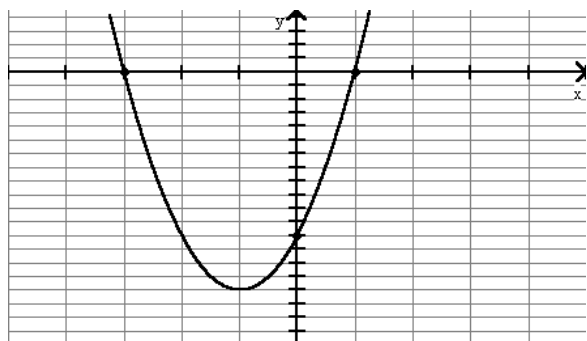
Vertex: \_\_\_\_\_  
 Axis of Symmetry: \_\_\_\_\_  
 Direction: \_\_\_\_\_  
 x-intercepts: \_\_\_\_\_  
 x-intercepts: \_\_\_\_\_  
 Domain: \_\_\_\_\_  
 Range: \_\_\_\_\_



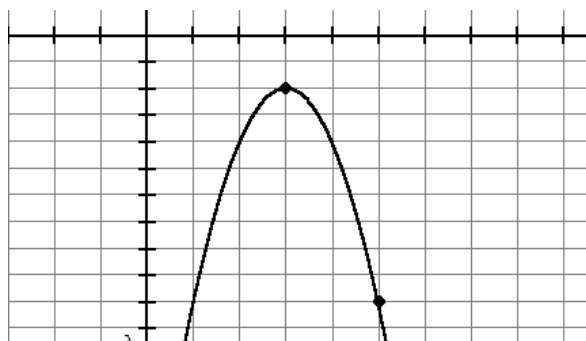
### Writing Quadratic Equations

Write the equation for the following graphs.

19. \_\_\_\_\_



20. \_\_\_\_\_



21. Write the equation for the quadratic function with a vertex at  $(-2, 3)$  and passes through the point  $(4, 12)$



**Part II.**

**1. Solve  $|5x + 9| + 16 = 22$ . Check your solutions.**

a.  $\{-\frac{3}{5}, 3\}$

c.  $\{-3, \frac{3}{5}\}$

b.  $\{\frac{3}{5}, 3\}$

d.  $\{-3, -\frac{3}{5}\}$

**2. Solve  $5x + 24 = |8 - 3x|$ . Check your solutions.**

a.  $\{-16\}$

c.  $\{-16, -2\}$

b.  $\{-2\}$

d.  $\{2, 16\}$

**3. Given the function  $f(x) = -3x^2 - 7x + 23$ , find  $f(-4)$ .**

a. 3

c. 99

b. 195

d. -5

**4. Given the function  $f(x) = -3x^2 - 7x + 23$ , find  $f(n + 5)$ .**

a.  $-3n^2 - 37n + 28$

c.  $-3n^2 - 37n - 87$

b.  $-3n^2 - 25n - 87$

d.  $-3n^2 - 37n + 17$

**5. Find the slope of the line containing the points  $(-5, 4)$  and  $(6, -9)$ .**

a.  $-\frac{13}{11}$

c.  $-\frac{11}{13}$

b. -13

d.  $-\frac{3}{5}$

6. Determine the slope of the line  $7x - 4y = 12$

a. 7

c. -3

b.  $\frac{4}{7}$

d.  $\frac{7}{4}$

7. Find the standard form of a line that contains the point  $(5,-7)$  and has a slope

$$m = -\frac{13}{5}.$$

a.  $\frac{13}{5}x + y = 6$

c.  $5x - 7y = 6$

b.  $13x + 5y = 30$

d.  $y = -\frac{13}{5}x + 6$

8. Find the slope-intercept form of a line passing through the points  $(-4, 1)$  and  $(5, 2)$ .

a.  $y = -\frac{5}{3}x + \frac{31}{3}$

c.  $y = -\frac{1}{9}x + \frac{23}{9}$

b.  $y = 3x - 13$

d.  $y = \frac{1}{9}x + \frac{13}{9}$

9. Write the slope-intercept form of the equation of a line passing through the point  $(2,1)$  and perpendicular to the line  $4x - 2y = 3$ .

a.  $y = 2x - 3$

c.  $y = \frac{1}{2}x$

b.  $y = -\frac{1}{2}x + 2$

d.  $y = 2x + 5$

10. Write the slope-intercept form of the equation of a line passing through the point

(1, -1), parallel to the line passing through the points (4, 1) and (2, -3).

a.  $y = 2x - 3$

c.  $y = -3x + 2$

b.  $y = -5x + 4$

d.  $y = 4x + 7$

11.  $\sqrt{162}$

a.  $2\sqrt{3}$

c.  $3\sqrt{3}$

b.  $9\sqrt{2}$

d.  $3\sqrt{2}$

12.  $\sqrt{150a^2b^2c}$

a.  $6abc\sqrt{5}$

c.  $5ab\sqrt{6c}$

b.  $5abc\sqrt{6}$

d.  $6ab\sqrt{5c}$

13. Simplify:  $-6\sqrt{5} - 2\sqrt{49} - 3\sqrt{45}$

a.  $-9\sqrt{5} + 14$

b.  $-9\sqrt{5} - 14$

c.  $-15\sqrt{5} - 14$

d.  $-15\sqrt{5} - 7$

14. Simplify  $(\sqrt{16} - \sqrt{8})^2$

a.  $24 - 16\sqrt{2}$

c.  $8 - 16\sqrt{2}$

b.  $2 + 16\sqrt{2}$

d.  $8 - 16\sqrt{2}$

15. Simplify  $\frac{6\sqrt{3}}{-9+\sqrt{6}}$

a.  $\frac{-54\sqrt{3} - 18\sqrt{2}}{75}$

c.  $\frac{(-9 - \sqrt{6})}{75}$

b.  $\frac{-54\sqrt{3} + 18\sqrt{2}}{(-9 - \sqrt{6})}$

d.  $\frac{6\sqrt{3}}{75}$

16. Solve the radical equation:  $\sqrt{9x-9} + 5 = 10$

a.  $\frac{34}{9}$

c.  $\frac{109}{9}$

b.  $\frac{104}{9}$

d.  $\frac{14}{9}$

17. Solve the system of equations:  $\begin{cases} 2x - y = 7 \\ 3x + y = 8 \end{cases}$

a. (-1, 3)

c. (-3, 1)

b. (1, -3)

d. (3, -1)

18. Solve the system of equations:  $\begin{cases} 5x + 2y = -8 \\ 4x + 3y = 2 \end{cases}$

a. (-4, 6)

c. (6, -4)

b. (4, -6)

d. (-6, 4)

19. Solve the system of equations:  $\begin{cases} 2y = 3x - 7 \\ 4x = 3y + 10 \end{cases}$

a.  $(-1, -2)$

c.  $(2, -1)$

b.  $(1, 2)$

d.  $(1, -2)$

20. Factor completely:  $2x^2 - 3x - 2$

a.  $(2x + 1)(x + 2)$

c.  $(2x - 1)(x - 2)$

b.  $(2x - 1)(x + 2)$

d.  $(2x + 1)(x - 2)$

21. Factor completely:  $16x^2 - 8x + 1$

a.  $(4x + 1)(4x - 1)$

c.  $(4x - 1)^2$

b.  $(8x + 1)(8x - 1)$

d.  $(4x + 1)^2$

22. Factor completely:  $6x^2 + 5x - 6$

a.  $(3x - 2)(2x + 3)$

c.  $(2x + 3)(2x - 3)$

b.  $(3x - 2)(3x + 2)$

d.  $(3x + 2)(2x - 3)$

23. Factor completely:  $8x^2 - 4x - 24$

a.  $4(2x^2 - x - 6)$

c.  $4(2x + 3)(x - 2)$

b.  $(2x + 3)(4x - 8)$

d.  $4(2x - 3)(x + 2)$

24. Factor completely:  $a^2 - 4ab + 4b^2$

a.  $(a + 2b)(a - 2b)$

c.  $(2a + b)(a - 2b)$

b.  $(a + 2b)(a + 2b)$

d.  $(a - 2b)(a - 2b)$

25. Factor completely:  $36x^2 - 100y^2$

a.  $(6x + 10y)(6x - 10y)$

c.  $4(3x + 5y)(3x + 5y)$

b.  $2(18x^2 - 50y^2)$

d.  $4(3x + 5y)(3x - 5y)$

26. Factor completely:  $8x^3 - 27$

a.  $(2x - 3)(2x^2 - 6x - 3)$

c.  $(2x + 3)(2x^2 + 6x - 3)$

b.  $(2x - 3)(4x^2 + 6x + 9)$

d.  $(2x + 3)(4x^2 + 6x + 9)$

27. Factor completely:  $8x^3 - 128x$

a.  $8(x + 4)(x - 4)$

c.  $8x(x + 4)(x - 4)$

b.  $8(x^2 - 16)$

d.  $8x(x^2 - 16)$

28. Solve the equation by factoring:  $6x^2 - 2x = 0$

a.  $\{0, \frac{1}{3}\}$

c.  $\{-\frac{1}{3}, 0\}$

b.  $\{\frac{1}{3}, 2\}$

d.  $\{-\frac{1}{3}, 2\}$

29. Solve the equation by factoring:  $x^2 + x - 30 = 0$

- a.  $\{-5, 6\}$
- b.  $\{-6, -5\}$
- c.  $\{-6, 5\}$
- d.  $\{5, 6\}$

30. Solve the equation by factoring:  $6x^2 - 5x - 4 = 0$

- a.  $\{-\frac{1}{2}, \frac{4}{3}\}$
- b.  $\{-\frac{4}{3}, -\frac{1}{2}\}$
- c.  $\{-\frac{4}{3}, \frac{1}{2}\}$
- d.  $\{\frac{1}{2}, \frac{4}{3}\}$

31. Solve the equation by factoring:  $12x^2 = -18x - 6$

- a.  $\{\frac{1}{2}, 1\}$
- b.  $\{-\frac{1}{2}, 1\}$
- c.  $\{-1, \frac{1}{2}\}$
- d.  $\{-1, -\frac{1}{2}\}$

32. Find the product:  $(-5xy)(4x^2)(-3y^4)$

- a.  $-4x^3y^5$
- b.  $-60x^3y^5$
- c.  $60x^2y^4$
- d.  $60x^3y^5$

33. Find the product:  $(2x^3y^2z^5)^3(-3xy^2z)^2$

- a.  $72x^{11}y^{10}z^{17}$
- b.  $36x^8y^9z^{10}$
- c.  $-72x^{11}y^{10}z^{16}$
- d.  $-36x^{11}y^{10}z^{17}$

34. Simplify the expression:  $\frac{(3xy)^2 z^{-4}}{x^{-1} y^2 z^7}$

a.  $\frac{9x^2}{yz^{11}}$

c.  $\frac{6x}{z^3}$

b.  $\frac{9x^3}{z^{11}}$

d.  $\frac{6xy}{z}$

35. Simplify the expression:  $\frac{(-2mn^2)^{-3}}{4m^{-6}n^4}$

a.  $\frac{m^5}{32n^{10}}$

c.  $-\frac{m^3}{32n^{10}}$

b.  $\frac{2m^9}{n}$

d.  $\frac{8n}{m}$

36. Multiply the polynomials:  $(x - 3)(x^2 - 4x + 2)$

a.  $x^3 + 7x^2 + 14x + 6$

c.  $x^3 - x^2 + 14x - 6$

b.  $x^3 - 7x^2 + 14x - 6$

d.  $x^3 + x^2 + 14x - 6$

37. Multiply the polynomials:  $(3x^2 - 2x + 1)(2x^2 - 3x - 4)$

a.  $6x^4 - 13x^3 - 4x^2 + 5x - 4$

c.  $6x^4 + 5x^3 - 4x^2 - 5x - 4$

b.  $6x^4 - 5x^3 - 8x^2 + 11x - 4$

d.  $6x^4 + 13x^3 - 8x^2 - 11x$



38. Write a quadratic equation in standard form with the given roots:  $-5$  and  $2$

a.  $x^2 - 7x + 10 = 0$

c.  $x^2 - 3x + 10 = 0$

b.  $x^2 + 7x + 10 = 0$

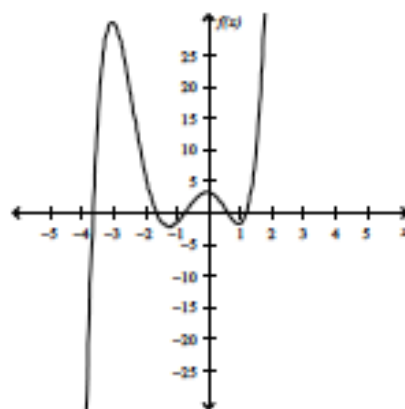
d.  $x^2 + 3x - 10 = 0$

39. Determine whether the given function has a maximum or a minimum value. Then find the maximum or minimum value of the function:

$$f(x) = x^2 - 2x + 2$$

- a. The function has a maximum value. The maximum value of the function is 1.
- b. The function has a maximum value. The maximum value of the function is 5.
- c. The function has a minimum value. The minimum value of the function is 1.
- d. The function has a minimum value. The minimum value of the function is 5.

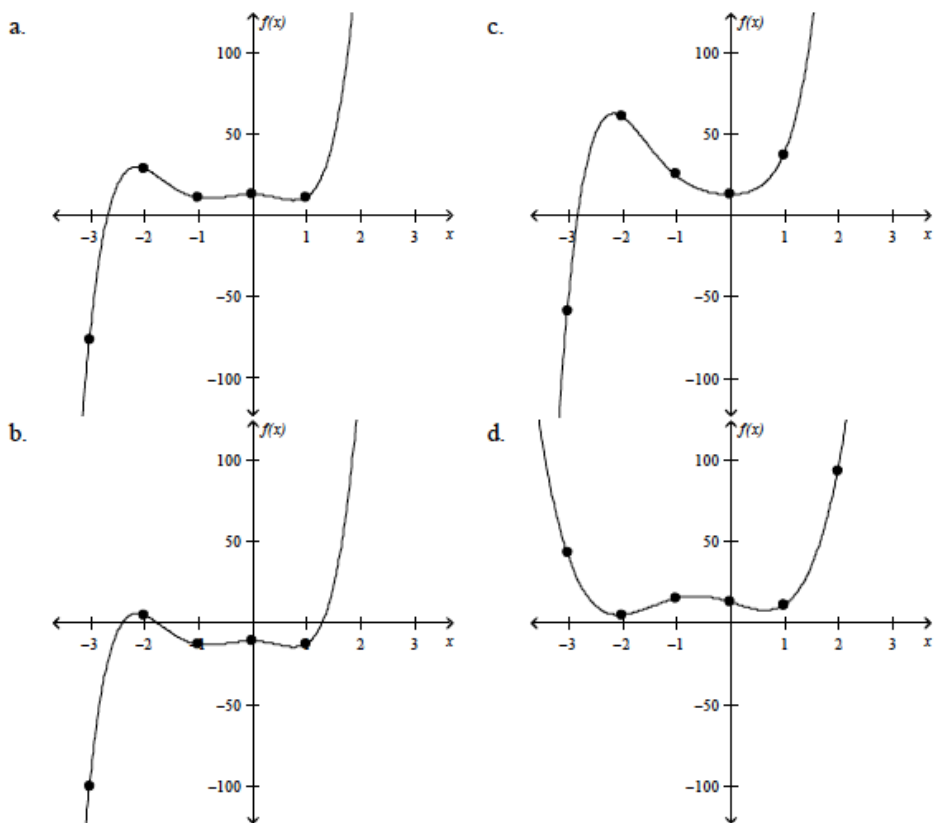
40. For the given graph,



- describe the end behavior,
- determine whether it represents an odd-degree or even-degree polynomial function, and
- state the number of real zeros.

- The end behavior of the graph is  $f(x) \rightarrow +\infty$  as  $x \rightarrow +\infty$  and  $f(x) \rightarrow +\infty$  as  $x \rightarrow -\infty$ .  
It is an odd-degree polynomial function.  
The function has five real zeros.
- The end behavior of the graph is  $f(x) \rightarrow +\infty$  as  $x \rightarrow +\infty$  and  $f(x) \rightarrow -\infty$  as  $x \rightarrow -\infty$ .  
It is an odd-degree polynomial function.  
The function has five real zeros.
- The end behavior of the graph is  $f(x) \rightarrow +\infty$  as  $x \rightarrow +\infty$  and  $f(x) \rightarrow -\infty$  as  $x \rightarrow -\infty$ .  
It is an odd-degree polynomial function.  
The function has four real zeros.
- The end behavior of the graph is  $f(x) \rightarrow +\infty$  as  $x \rightarrow +\infty$  and  $f(x) \rightarrow -\infty$  as  $x \rightarrow -\infty$ .  
It is an even-degree polynomial function.  
The function has five real zeros.

41. Graph the function  $f(x) = 3x^5 + 8x^4 - 3x^3 - 10x^2 + 12$  by making a table of values.



42. Simplify the rational expression. Then state the excluded values:  $\frac{x^2-4}{x^2+6x+8}$

a.  $\frac{x+2}{x+4}$ ;  $x \neq -4$  and  $x \neq 2$

b.  $\frac{x-2}{x+4}$ ;  $x \neq -4$  and  $x \neq -2$

c.  $\frac{x-2}{x+2}$ ;  $x \neq -2$  and  $x \neq 2$

d.  $\frac{x-2}{x+2}$ ;  $x \neq -4$  and  $x \neq -2$

43. Multiply the rational expression:  $\frac{x^2-64}{2x+16} \cdot \frac{x+8}{x^2+16x+64}$

a.  $\frac{x-8}{x+8}$

c.  $\frac{x+8}{2}$

b.  $\frac{x-8}{2}$

d.  $\frac{x-8}{2(x+8)}$

44. Divide the rational expressions and write your answer in simplest terms:

$$\frac{12c^2d}{5a^2b^2} \div \frac{c^2d^2}{10ab}$$

a.  $\frac{12}{abc}$

c.  $\frac{12c}{5ab}$

b.  $\frac{24}{abd}$

d.  $\frac{24cd}{ab}$

45. Divide the rational expression and write your answer in simplest terms:

$$\frac{x^2 - 9}{2x^2 + 13x - 7} \div \frac{x + 3}{4x^2 - 1}$$

a.  $\frac{(x-3)(2x+1)}{(x+7)}$

c.  $\frac{(x+3)(x-3)(2x+1)}{(x+7)(x-3)}$

b.  $\frac{(x-3)(2x-1)}{(x-7)}$

d.  $\frac{x-3}{x+7}$

46. Add the rational expressions:  $\frac{3x+3}{x^2+2x+1} + \frac{x-1}{x^2-1}$

a.  $\frac{3x}{(x+1)(x-1)}$

c.  $\frac{4}{x+1}$

b.  $\frac{2x-3}{(x+1)(x-1)}$

d.  $\frac{5x}{x+1}$

47. Subtract the rational expressions:  $\frac{4}{4x^2-4x+1} - \frac{5x}{20x^2-5}$

a.  $\frac{2x^2-9x-1}{(2x+1)(2x-1)^2}$

c.  $\frac{2x^2+7x+4}{(2x+1)(2x-1)^2}$

b.  $\frac{-2x^2+9x+4}{(2x+1)(2x-1)^2}$

d.  $\frac{-2x^2+7x-4}{(2x+1)(2x-1)^2}$

48. Solve the rational equation:  $\frac{2x+1}{3} - \frac{x-5}{4} = \frac{1}{2}$

a.  $-\frac{13}{5}$

c.  $\frac{5}{13}$

b.  $\frac{13}{5}$

d.  $-\frac{5}{13}$

49. Solve the rational equation:  $\frac{3m+2}{5m} + \frac{2m-1}{2m} = 4$

a.  $\frac{1}{24}$

c. 24

b.  $-\frac{1}{24}$

d. -24

50.

Find the exact value of the expression without using a calculator or table.

1)  $\cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$

A)  $\frac{7\pi}{4}$

B)  $\frac{\pi}{6}$

C)  $\frac{\pi}{4}$

D)  $\frac{11\pi}{6}$

51. Find all real numbers that satisfy the equation  $\cos x = 1$ .

A)  $\left\{x \mid x = \frac{\pi}{2} + 2k\pi\right\}$

B)  $\{x \mid x = \pi + 2k\pi\}$

C)  $\left\{x \mid x = \frac{3\pi}{2} + 2k\pi\right\}$

D)  $\{x \mid x = 0 + 2k\pi\}$

52. Find all values of  $\theta$  in  $[0^\circ, 360^\circ)$  that satisfy the equation.

$\sin \theta = -\frac{1}{2}$

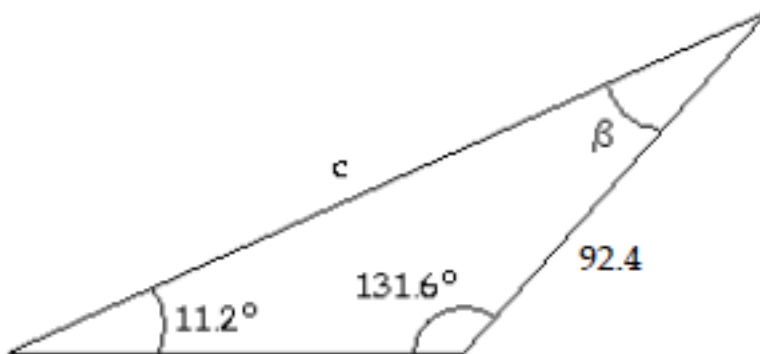
A)  $\{60^\circ, 300^\circ\}$

B)  $\{150^\circ, 210^\circ\}$

C)  $\{210^\circ, 330^\circ\}$

D)  $\{60^\circ, 120^\circ\}$

53. Solve the triangle with the given parts.



A)  $\beta = 37.2^\circ, b = 355.7, c = 287.6$

B)  $\beta = 36.8^\circ, b = 285, c = 355.7$

C)  $\beta = 37.2^\circ, b = 29.7, c = 24.1$

D)  $\beta = 37.2^\circ, b = 287.6, c = 355.7$

54. Find the area of the triangle using Heron's formula. Round to the nearest unit.

$a = 64.6$

$b = 65.4$

$c = 67.2$

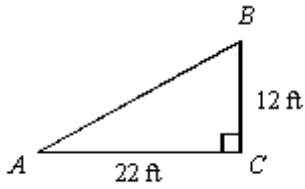
A) 1869

B) 1947

C) 1961

D) 1941

55. Find the values of sine, cosine, and tangent for  $\angle A$ .



- A)  $\sin A = \frac{\sqrt{157}}{11}$ ,  $\cos A = \frac{\sqrt{157}}{6}$ ,  $\tan A = \frac{11}{6}$   
B)  $\sin A = \frac{6\sqrt{157}}{157}$ ,  $\cos A = \frac{11\sqrt{157}}{157}$ ,  $\tan A = \frac{6}{11}$   
C)  $\sin A = \frac{\sqrt{157}}{6}$ ,  $\cos A = \frac{\sqrt{157}}{11}$ ,  $\tan A = \frac{6}{11}$   
D)  $\sin A = \frac{11\sqrt{157}}{157}$ ,  $\cos A = \frac{6\sqrt{157}}{157}$ ,  $\tan A = \frac{11}{6}$

56. In right triangle  $ABC$ ,  $A = 76^\circ$ ,  $a = 13$ , and  $\angle C$  is the right angle. Solve the triangle.

- a.  $B = 14^\circ$ ,  $b = 12.6$ ,  $c = 18.1$     c.  $B = 14^\circ$ ,  $b = 3.2$ ,  $c = 13.4$   
b.  $B = 14^\circ$ ,  $b = 18.1$ ,  $c = 12.6$     d.  $B = 14^\circ$ ,  $b = 13.4$ ,  $c = 3.2$

**Short Answer:** You must show all your work on the student work sheet that has been provided to you. If you need more room, please attach a separate sheet of paper. Box your answers.

### Exponents

*Directions – Simplify using only positive exponents and no calculator!*

<b>Properties:</b>	$a^m \cdot a^n = a^{m+n}$	$(a^m)^n = a^{m \cdot n}$	$a^{\frac{p}{r}} = \sqrt[r]{a^p}$
	$a^{-n} = \frac{1}{a^n}$	$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$	$\frac{a^m}{a^n} = a^{m-n}$

57.  $\left(\frac{81}{64}\right)^{-\frac{1}{2}}$

58.  $(27^{-2})^{-\frac{1}{3}}$

59.  $\frac{(3x^2)^{-1}}{6x^{-3}}$

60. a.  $-2^4$   
b.  $(-2)^4$

61.  $\frac{3^{-5} \cdot 3^{10}}{3^2}$

62.  $(4^{-1} + 2^{-1})^2$   
- hint 1:  $(a^{-m} + a^{-n})^p = a^{-mp} + a^{-np}$   
- hint 2: Apply the neg. exponent property to each term. Then get a common denom. and add

### Logarithms

*Directions – Solve for x.*

Given  $\log_b a = x$ , then  $b^x = a$  where  $b > 0$  but  $b \neq 1$ , and  $a > 0$ .

63.  $3\log_2 x = 12$

64.  $\log_5 125 = x$

65.  $3 + 4\log_x 4 = 5$

66.  $\frac{3}{2}\log_{27}(x + 5) = 1$

**Graph the functions:**

67.  $h(x) = |2x + 1|$

68.  $h(x) = \begin{cases} \frac{x}{3} & \text{if } x \leq 0 \\ 2x - 6 & \text{if } 0 < x < 2 \\ 1 & \text{if } x \geq 2 \end{cases}$

**Use Synthetic Division to divide:**

69.  $(3x^3 - 7x^2 + 9x - 14) \div (x - 2)$

70.  $(x^4 - 4x^3 + x^2 + 7x - 2) \div (x + 3)$

71.



For  $h(x) = x^4 - 15x^2 + 38x - 60$ ,

- How many zeros should this polynomial function have?
- How many turns could the graph of the equation make?
- What is the end behavior of the graph of the function?
- State the number of positive, negative, and imaginary zeros using Descartes Rule of Signs.
- Use the Rational Zero Theorem to find the possible rational zeros of this polynomial function.
- Find all the zeros of the polynomial function (real and imaginary).

72.

**Given the following quadratic equation  $y = x^2 - 8x + 15$ , find**

- the direction of opening
- the axis of symmetry
- the vertex
- the maximum/minimum value
- the y-intercept
- the x-intercepts/roots/zeros
- graph the parabola, finding at least 3 additional points

**Write the equation on vertex form.**

**On the attached graph paper, graph each line. Label each problem.**

73.  $y = 2x + 5$

74.  $y = 0$

75.  $y = -\frac{2}{3}x + 8$

76.  $3x - 4y = 12$

Name: \_\_\_\_\_

Pre-Calculus Summer Assignment Student Answer Sheet

- |           |           |           |
|-----------|-----------|-----------|
| 1. _____  | 20. _____ | 39. _____ |
| 2. _____  | 21. _____ | 40. _____ |
| 3. _____  | 22. _____ | 41. _____ |
| 4. _____  | 23. _____ | 42. _____ |
| 5. _____  | 24. _____ | 43. _____ |
| 6. _____  | 25. _____ | 44. _____ |
| 7. _____  | 26. _____ | 45. _____ |
| 8. _____  | 27. _____ | 46. _____ |
| 9. _____  | 28. _____ | 47. _____ |
| 10. _____ | 29. _____ | 48. _____ |
| 11. _____ | 30. _____ | 49. _____ |
| 12. _____ | 31. _____ | 50. _____ |
| 13. _____ | 32. _____ | 51. _____ |
| 14. _____ | 33. _____ | 52. _____ |
| 15. _____ | 34. _____ | 53. _____ |
| 16. _____ | 35. _____ | 54. _____ |
| 17. _____ | 36. _____ | 55. _____ |
| 18. _____ | 37. _____ | 56. _____ |
| 19. _____ | 38. _____ |           |

Name: \_\_\_\_\_

### Pre-Calculus Summer Assignment Student Work

1.	2.
3.	4.
5.	6.

7.	8.
9.	10.
11.	12.

13.	14.
15.	16.
17.	18.

19.	20.
21.	22.
23.	24.

25.	26.
27.	28.
29.	30.



31.	32.
33.	34.
35.	36.

37.	38.
39.	40.
41.	42.

43.	44.
45.	46.
47.	48.

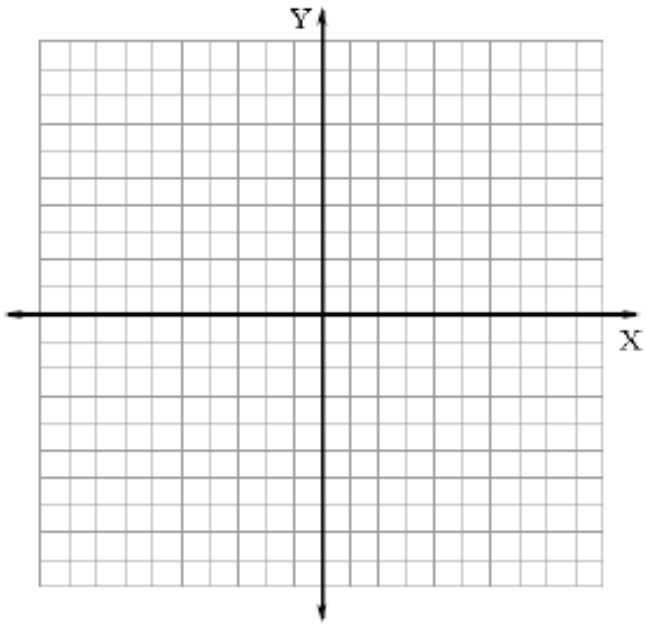
Short Answer.

49.	50.
51.	52.
53.	54.

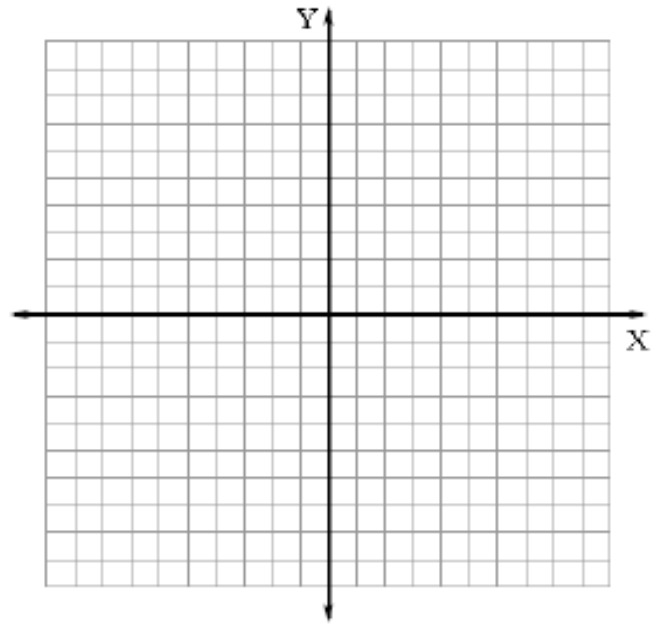
55.	56.
57.	58.
59.	60.

61.	62.
63.	64.
65.	66.

67.



68.



69.

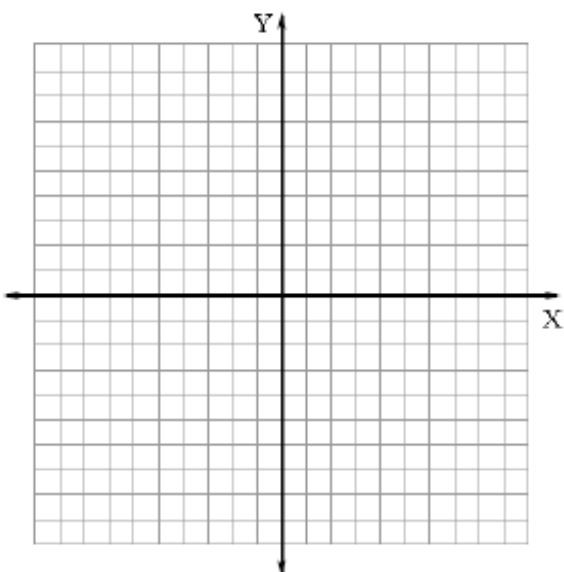
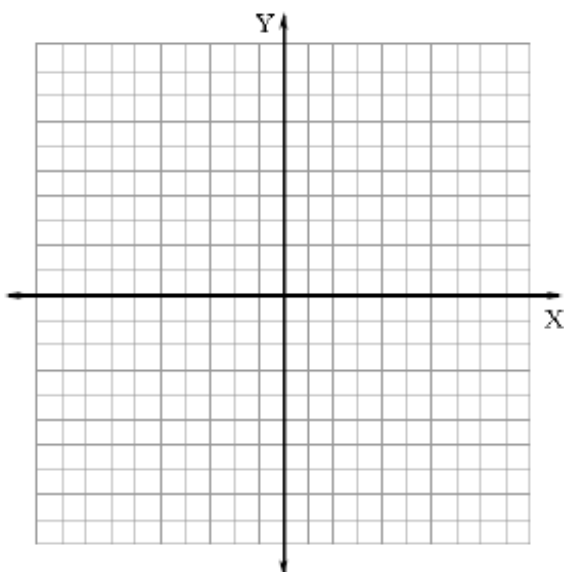
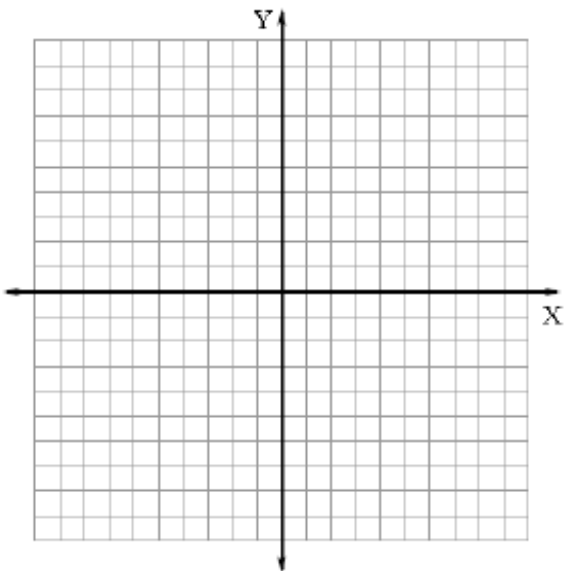
70.

71.

72.



### Graphs (#73-76)

<p># _____</p> 	<p># _____</p> 
<p># _____</p> 	<p># _____</p> 