

# **REQUIRED SUMMER WORK FOR HONORS PRECALCULUS**

**Teacher – Mr. Yates**

**This summer work includes both review topics and some new topics. One of the goals of summer work is to have you practice and reinforce skills you already have; the other primary goal is to have you work independently to learn new skills. These goals are essential to honors students.**

**All problems are to be completed neatly, with answers in appropriate spaces. Appropriate work and/or explanation should be shown in the spaces provided.**

**If the difficulty of this work is overwhelming, you should consider a regular academic class rather than honors. In the academic classes, we will spend more class time on these topics rather than accelerating ahead to other things. If you are weak in any of your fundamental math skills or if your dedication to academics is not up to par, you will not fully benefit from taking an honors course.**

**If you have any questions, feel free to email me at *[jyates@bloomsd.k12.pa.us](mailto: jyates@bloomsd.k12.pa.us)*  
Please type “summer honors work” in the subject line. I try to check my email at least once a week over the summer. Do not wait until the week before school to email me with a concern.**

**Have a good summer, and I will see you in August!**

name \_\_\_\_\_

For each relation, state the *domain* and *range*; is it a function? (yes or no)

1.  $\{(-1,2), (3,10), (-2,20), (3,11)\}$       2.  $\{(0,2), (13,6), (2,2), (3,1)\}$

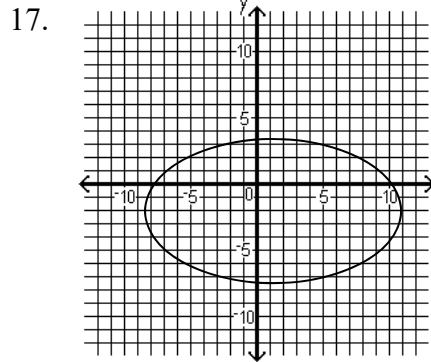
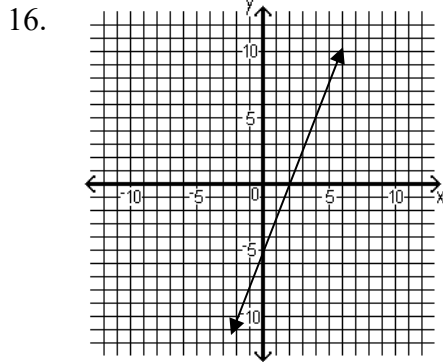
Given  $f(x) = |3x - 4| + 5$ , find each value.

3.  $f\left(\frac{1}{3}\right)$       4.  $f(-2)$       5.  $f(2)$

Name all values of  $x$  that are not in the domain of the given function.

6.  $f(x) = \frac{x-2}{x+3}$       7.  $f(x) = \frac{1}{|2x+5|}$       8.  $f(x) = \frac{x^2+9}{x^2-16}$

Use the *vertical line test* to determine if each relation is a function. (yes/no)



Find the zero of each function.

18.  $f(x) = 2x + 10$       19.  $f(x) = \frac{2}{3}x - 12$

1)  $d =$  \_\_\_\_\_

$r =$  \_\_\_\_\_

2)  $d =$  \_\_\_\_\_

$r =$  \_\_\_\_\_

3) \_\_\_\_\_

4) \_\_\_\_\_

5) \_\_\_\_\_

6) \_\_\_\_\_

7) \_\_\_\_\_

8) \_\_\_\_\_

16) \_\_\_\_\_

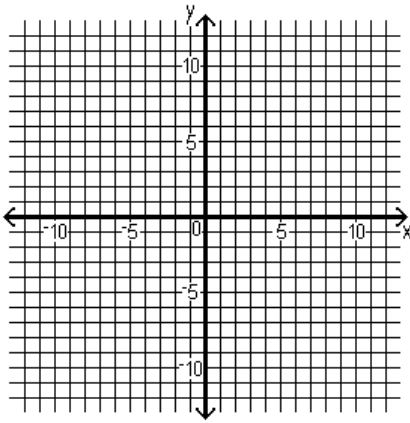
17) \_\_\_\_\_

18) \_\_\_\_\_

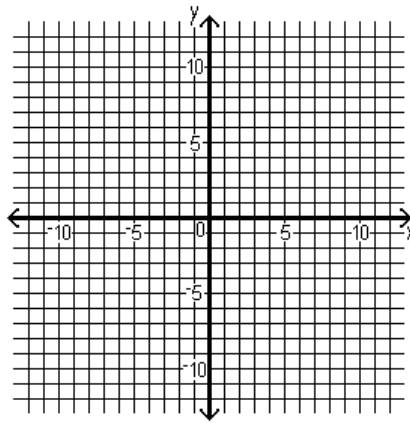
19) \_\_\_\_\_

Graph each equation or inequality.

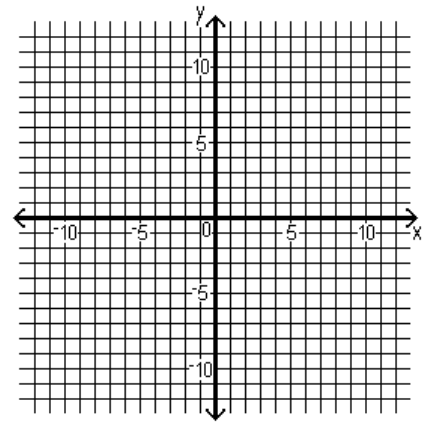
20.  $y = 3x - 2$



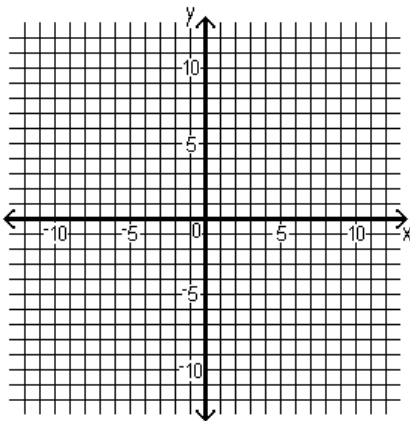
21.  $x = -2$



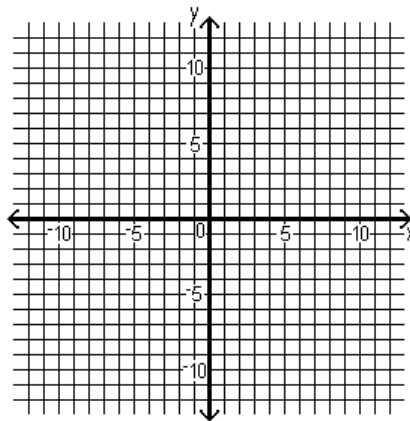
22.  $2x + 7y = 14$



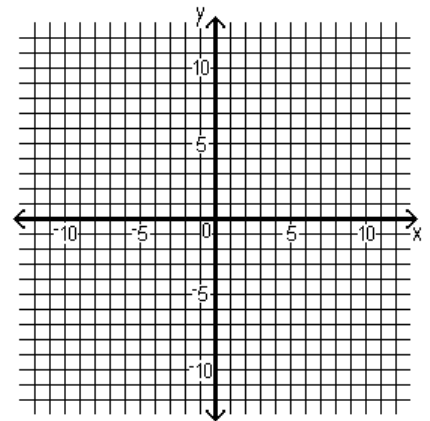
23.  $y > -2x - 2$



24.  $3x - 2y < 12$



25.  $-4 \leq x - 2y \leq 6$



26. Find the distance between the points  $(-2, 2)$  and  $(8, -3)$ .

26) \_\_\_\_\_

27. Find the slope of the line passing through  $(-2, 2)$  and  $(8, -3)$ .

27) \_\_\_\_\_

28. Collinear points lie on the same line. Find the value of  $k$  for which the following points are collinear:  $(k, 3)$ ,  $(-3, 2)$ ,  $(-1, 1)$

28) \_\_\_\_\_

29-34: Write two equations for each line, one in *slope-intercept* form  $y = mx + b$  and one in *point-slope* form  $(y - y_1) = m(x - x_1)$ .

29. slope = 5; passes through the point (3,-2)

29) \_\_\_\_\_  
\_\_\_\_\_

30. passes through the points (3,11) and (-6,5)

30) \_\_\_\_\_  
\_\_\_\_\_

31. x-intercept = 3; y-intercept = 2

31) \_\_\_\_\_  
\_\_\_\_\_

32. passes through the points (3,3) and (6,3)

32) \_\_\_\_\_  
\_\_\_\_\_

33. parallel to the line  $y = -2x + 5$  and passes through the point (1,4)

33) \_\_\_\_\_  
\_\_\_\_\_

34. perpendicular to the line  $y = 2x + 6$ ; passes through the point (0,9)

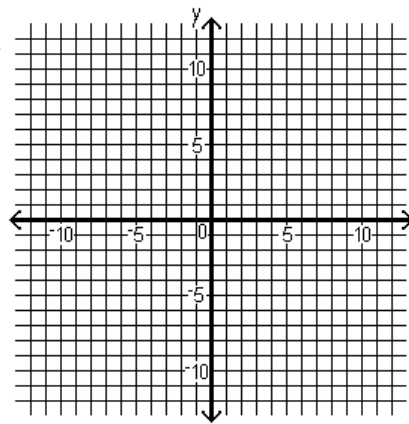
34) \_\_\_\_\_  
\_\_\_\_\_

35. Are the graphs of  $4x + 3y + 6 = 0$  and  $y = \frac{4}{3}x + 3$  *parallel*, *perpendicular*, or *neither*? Why?

38. Find the perimeter of  $\triangle ABC$  if the vertices are A(3,2), B(3,-6), and C(6,-2) (hint: distance)

39. Solve the system by graphing, identify the intersection.

$$\begin{cases} 3x - y = 6 \\ y = -x + 6 \end{cases}$$



39) \_\_\_\_\_

Solve each system of equations algebraically. (elimination or substitution)

40.  $\begin{cases} 3x - 2y = 7 \\ y = -x + 4 \end{cases}$

41.  $\begin{cases} 4x - 3y = 15 \\ y = -2x + 5 \end{cases}$

40) \_\_\_\_\_

41) \_\_\_\_\_

42.  $\begin{cases} 3x + 4y = 8 \\ -3x - 4y = 10 \end{cases}$

43.  $\begin{cases} 3x - 2y = -9 \\ 4x + 5y = 11 \end{cases}$

42) \_\_\_\_\_

43) \_\_\_\_\_

44.  $\begin{cases} x - 2y + z = 7 \\ 3x + y - z = 2 \\ 2x + 3y + 2z = 7 \end{cases}$

44) \_\_\_\_\_

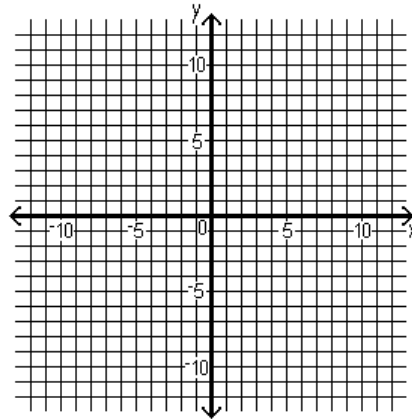
45. The angles of a triangle measure  $45^\circ$ ,  $x^\circ$ , and  $y^\circ$ . If  $x$  is three times as much as  $y$ , write a system of two equations to represent the situation and solve for  $x$  and  $y$ .

45)  $x =$  \_\_\_\_\_

$y =$  \_\_\_\_\_

46. Graph the system of inequalities, identify the vertices of the polygon.

$$\begin{aligned} y &\geq 0 \\ x &\geq 1 \\ x + y &\leq 6 \\ 3x + y &\leq 12 \end{aligned}$$



46) four vertices:

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

47-58: Simplify completely.

47.  $3y^7 \cdot 2y^3 \cdot 5y^2$

48.  $(2x^4y^2z)^3$

47) \_\_\_\_\_

48) \_\_\_\_\_

49.  $\frac{18m^8n^6}{-9mn^7}$

50.  $(3a^4c^{-2})^3(-3ac^3)^2$

49) \_\_\_\_\_

50) \_\_\_\_\_

51.  $\sqrt{27r^4s^5}$

52.  $\sqrt[3]{8m^6n^9}$

51) \_\_\_\_\_

52) \_\_\_\_\_

53.  $\frac{\sqrt{5}}{\sqrt{12}}$

54.  $\sqrt{-147}$

53) \_\_\_\_\_

54) \_\_\_\_\_

55.  $27^{\frac{2}{3}}$

56.  $64^{\frac{-5}{6}}$

55) \_\_\_\_\_

56) \_\_\_\_\_

57.  $(2r+7)^2$

58.  $(c+4)(c-3)(c+3)$

57) \_\_\_\_\_

58) \_\_\_\_\_

Factor completely.

59.  $6x^2 - 2x - 20$

60.  $x^3 + 3x^2 - 4x - 12$

59) \_\_\_\_\_

60) \_\_\_\_\_

61. Fill in the table for the function  $f(x) = x^3 - 4x^2 - x + 4$

$x$	-3	-2	-1	0	1	2	3	4	5
$f(x)$									

63. Write a function that has roots at  $x = 2, 6$ .

63) \_\_\_\_\_

64-65: Solve by the quadratic formula.

64.  $2x^2 + 8x + 26 = 0$

64) \_\_\_\_\_

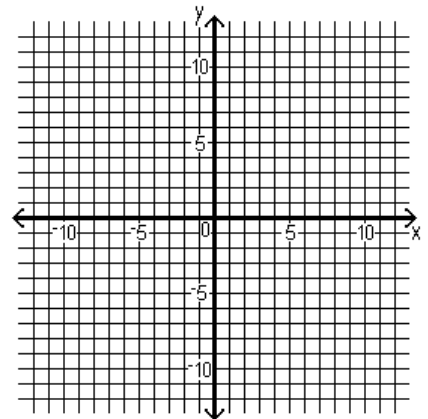
65.  $5x^2 - 3 = -7x + 8$  (round answers to hundredths)

65) \_\_\_\_\_

66. Using the function:  $y = x^2 - 4x - 5$ .

Fill in the table with values, then graph.

$x$	-2	-1	0	1	2	3	4	5	6
$y$									

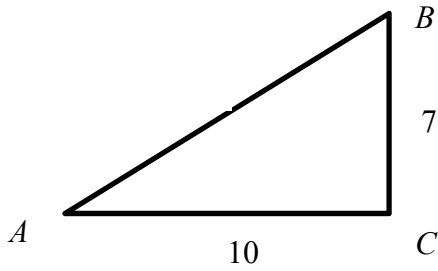


Identify the roots of the function

67. Given that -3 is a root of the function  $h(x) = x^3 + 2x^2 - 5x - 6$ , use synthetic division and factoring to identify the other roots.

67) \_\_\_\_\_

68. List all of the Trigonometric Ratios for angle A



$$\sin A =$$

$$\csc A =$$

$$\cos A =$$

$$\sec A =$$

$$\tan A =$$

$$\cot A =$$

Evaluate

72.  $\sin 30^\circ$

73.  $\tan 45^\circ$

72) \_\_\_\_\_

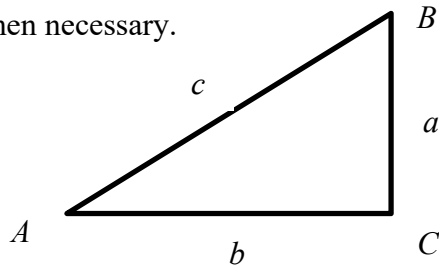
74. What is the hypotenuse of a right triangle with legs both equal to 10 inches?

73) \_\_\_\_\_

74) \_\_\_\_\_

74-75: Refer to the diagram, find all missing measurements using trigonometry.

Round to hundredths when necessary.



$$m\angle B =$$

75)  $a =$

$$c =$$

75.  $m\angle A = 38^\circ, m\angle C = 90^\circ, b = 14$

76.  $m\angle C = 90^\circ, a = 24, b = 35$

$$m\angle A =$$

76)  $m\angle B =$

$$c =$$