



Summer Mathematics Prep documents provide self-directed student review, practice, and preparation for high school mathematics courses. Students are encouraged to first attempt these review problems on their own. Checking accuracy against the solution document can help students identify their own strengths and areas of challenge. Students can utilize instructional online resources to address areas of challenge. All of these resources can be found at http://chesterfield.k12.va.us/htm/student_pages/summerheat.

Basic Properties of Real Numbers

Identify the property of real numbers illustrated for each of the following:

1) $4x^2 + 14x = 2x(2x + 7)$

2) $12 + (x + -x) = 12 + 0$

3) $\frac{4}{3} \cdot \frac{3}{4} = 1$

4) $(2 + 10) \cdot 6 = (10 + 2) \cdot 6$

5) $(2 + x) + 9 = 2 + (x + 9)$

6) $0 + (q + 2) = (q + 2)$

Evaluating Expressions & Functions

Evaluate each of the following expressions:

7) $25 \div (2 + 3) \cdot 8$

8) $36 - 4 \cdot 12 \div 6$

9) $10 - 4^2$

10) $(36 - 4) \cdot (12 \div 6)$

11) $(-5)^2$

Evaluate each expression using the given values:

12) $\frac{2(b - 2a)}{2b + a}$; $a = -3$, $b = 4$

13) $4r^3 - 5qr$; $q = 3$, $r = -2$

14) $y^2 + \frac{y - 5 + 6x}{x - y}$; $x = 10$, $y = -3$

Basic Laws of Exponents

Simplify each of the following using the properties of exponents:

15) $x^5 \cdot x^2$

16) $\frac{4x^3}{10x^8}$

17) $(2x^5)^3$

18) $4(x^5) + 6(x^5)$

19) $(x^2)^{-9}$

20) $3x^0$

21) $(4x)^0$

Simplifying Radicals

Simplify each of the following radicals:

22) $\sqrt{128}$

23) $(\sqrt{10})(\sqrt{5})$

24) $(3\sqrt{6})(5\sqrt{3})$

25) $\frac{4}{\sqrt{3}}$

Slope

Calculate the slope of the line passing through the given points:

26) (2, 3) and (-7, 5)

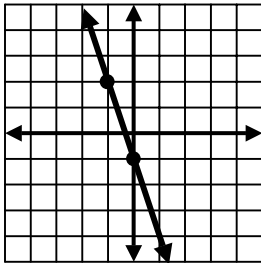
27) (-2, 7) and (6, 7)

28) State the slope of the line: $y = -\frac{3}{4}x + 8$.

29) State the slope of the line $x = -3$.

Writing Equations of Lines ($y = mx + b$)

30) State the equation of the line pictured.



31) Write the equation of the line that has a slope of -2 and passes through the point (8, -6).

32) Write the equation of a line that passes through $(-5, 3)$ and $(0, -2)$.

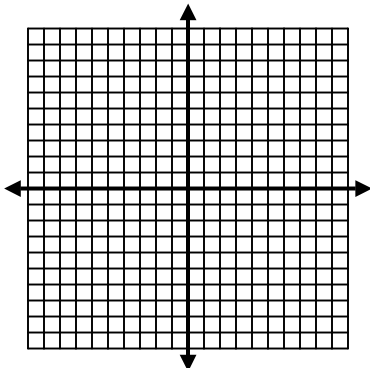
33) Write the equation of a line that passes through $(4, 3)$ and $(4, 7)$.

34) Write the equation of a line that passes through the point $(1, 1)$ and is parallel to the line $y = 5x - 3$.
(Reminder – parallel lines have equal slopes)

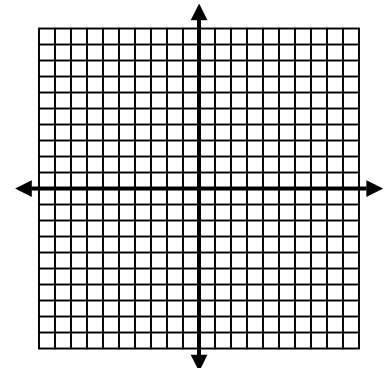
Graphing Lines

Graph each linear equation on the graph provided.

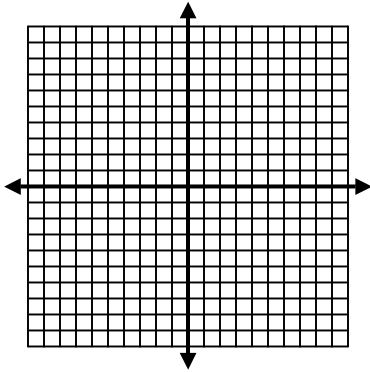
35) Graph $x = 3$



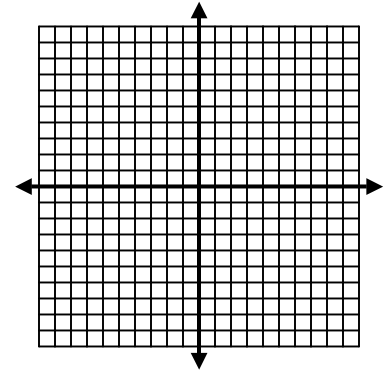
36) Graph $y = -3x - 2$



37) Graph $2x - 4y = 8$



38) Graph $y = -9$



Operations with Polynomials

Simplify each of the following polynomial expressions.

39) $(-3x^2 + 4x + 5) + (6x^2 - 5x - 8)$

40) $(-4x^3 + 5x + 19) - (3x^3 - 6x + 12)$

41) $(x - 1)(4x + 1)$

42) $(4x - 3)^2$

43) $(5x - 3)(5x + 3)$

44) $5x(3x^2 - x + 3)$

Solving Linear Equations

Solve each equation for the indicated variable.

45) $3x - 35 = 13$

46) $2y + 16 = -3y + 6$

47) $7 - 4z = 2(2z + 3)$

48) $\frac{2x}{3} - 4 = -8$

49) $3.2(3y - 4) = 4.6(y - 3)$

50) $\frac{7a}{2} - \frac{4}{3} = \frac{13}{6}$

Solving Systems of Linear Equations

Solve each system using the substitution method.

51)
$$\begin{cases} x = 2y + 1 \\ 3x - 2y = -1 \end{cases}$$

52)
$$\begin{cases} -3x + y = 2 \\ 8x - 15y = 7 \end{cases}$$

Solve each system using the elimination method.

$$53) \begin{cases} 2x - 3y = 12 \\ 2x + 3y = -14 \end{cases}$$

$$54) \begin{cases} 2x + 4y = 6 \\ 3x - 2y = 5 \end{cases}$$

Factoring

Factor completely each of the following expressions.

$$55) 2x^5 - 16x^3$$

$$56) x^2 - 64$$

$$57) x^2 + 3x - 18$$

$$58) 3x^2 - 7x - 6$$

Solve by Factoring

$$59) x^2 + 12x + 35 = 0$$

$$60) x^2 - 13x + 36 = 0$$