

SUMMER MATH PACKET FOR STUDENTS RISING TO ALGEBRA 1

Provided by Cox Math Tutoring

Directions: Complete the following problems without the use of a calculator, unless the problem is

accompanied by a calculator icon:



1. Simplify the expression. (PEMDAS!)

1.1. $14 \div 7 + 3^2$ 11

1.2. $42 \div 2(-12 + 9)$ -7

1.3. $\sqrt{49}$ 7

1.4. $|-14|$ 14

1.5. $18 - 30 \div 5$ 12

1.6. $48 \div (5 + 7) - 9$ -5

1.7. $4^3 - 5(2) + 13$ 67

2. Add/subtract/multiply/and divide rational numbers.

2.1. $-2 + 11 - 7$ 2

2.2. $5 - 3 + 12 - (-9)$ 23

2.3. $\frac{-4}{(\frac{3}{4})}$ $-\frac{16}{3}$ OR $-5\frac{1}{3}$

2.4. $(-2)(4)(-5)(-1)$ -40

2.5. $(\frac{3}{5})(-\frac{7}{12})$ $-\frac{7}{20}$

2.6. $-4 + -9 - 3(-6)$ 5

2.7. $\frac{3}{4} + \frac{1}{6}$ $\frac{11}{12}$

2.8. $2\frac{1}{3} - \frac{7}{9}$ $\frac{11}{9}$ OR $1\frac{2}{9}$

2.9. $(\frac{2}{3}) \div (1\frac{5}{9}) = \frac{3}{7}$
 $\frac{2}{3} \div \frac{14}{9} = \frac{2}{3} \cdot \frac{9}{14} = \frac{18}{42} = \frac{3}{7}$

3. Simplify each expression using the distributive property.

3.1. $3(b + 9)$ $3b + 27$

3.4. $x(2x + 4)$ $2x^2 + 4x$

3.2. $5(2x - 3)$
 $10x - 15$

3.5. $\frac{1}{2}(4r + 12)$ $2r + 6$

3.3. $-3(4x + 9)$
 $-12x - 27$

3.6. $-(6p - 11)$ $-6p + 11$

4. Evaluating expressions

4.1. $3(n - 1) + 2n$, when $n = 5$
 $3(5 - 1) + 2 \cdot 5 = 22$

4.2. $7b - 2a$, when $a = -3$ and $b = 4$
 34

4.3. $3x^2 + 5x + 1$, when $x = -2$
 3

4.4. $\frac{2r}{t} + 7$, when $r = 12$ and $t = 3$
 15

4.5. $(3x)^2 - 7y^2$, when $x = 3$ and $y = 2$
 53

4.6. $4(3d + 6) - 2d$, when $d = -6$
 90

5. Solve each equation.

5.1. $0 = -2 - 8b + 7b$
 $b = -2$

5.2. $8 - 5m - 2m = 1$
 $m = 1$

$$5.3. \quad -8 = p + 3 - 4$$

$$p = -7$$

$$5.10. \quad -6n + 2 = 13 + n - 2 + 5$$

$$n = -2$$

$$5.4. \quad 4x - 3 + 4x = -11$$

$$\begin{aligned} 8x - 3 &= -11 \\ +3 & \quad +3 \\ 8x &= -8 \\ x &= -1 \end{aligned}$$

$$5.11. \quad 7(8n - 3) + 5n = -265$$

$$n = -4$$

$$5.5. \quad 6a - 1 - 1 = 16$$

$$a = 3$$

$$5.12. \quad -2n - 4(6n + 4) = 88$$

$$n = -4$$

$$5.6. \quad -14 - 6n + 2n = n - 4$$

$$n = -2$$

$$5.13. \quad 96 = -4(5n + 6)$$

$$n = -6$$

$$5.7. \quad -15 + 3b = -8 + 2b$$

$$b = 7$$

$$5.14. \quad -133 = 7(1 - 5x)$$

$$x = -4$$

$$5.8. \quad 15 + 5x = x + 3 + 7x$$

$$x = 4$$

$$5.15. \quad 4 - 6(r - 5) = 82$$

$$r = -8$$

$$5.9. \quad -6v + 7v = -16 - v$$

$$v = -8$$

$$5.16. \quad -(7 - 3p) = -7 - 5p$$

$$p = 0$$

5.17. $-8(n - 7) = 8n + 24$

$n = 2$

5.18. $-29 + 7x = -(x + 5)$

$x = 3$

6. Match equation on the left with the property it illustrates on the right.

TYPO!

- 6.1. $4 + (9 + 6) = (4 + 9) + 6$ → A. Identity Property of Addition
6.2. $x + \underline{12} + 12 + x$ → B. Associative Property
6.3. $(3 + y) + 0 = 3 + y$ → C. Distributive Property
6.4. $x \cdot 1 = x$ → D. Identity Property of Multiplication
6.5. $5(x + y) = 5x + 5y$ → E. Commutative Property

7. Simplify each expression by distributing and combining like terms.

7.1. $4x + 7y - 14x + 2y$

$-10x + 9y$

7.2. $-13 - 4y - 5z + 15 - (-4z) + 11y$

$2 - 9z + 7y$

7.3. $20xy + 3x^2y - 10x^2y - 30xy$

$-10xy - 7x^2y$

7.4. $-3(2x - 5y)$

$-6x + 15y$

7.5. $9(6 + 2y) - 5 + 2y$

$49 + 20y$

8. Write an algebraic expression or equation to represent each verbal expression.

8.1. The sum of six times a number and 25 $6x + 25$

8.2. 7 less than fifteen times a number $15x - 7$

8.3. Four times the square of a number increased by five times the same number $4x^2 + 5x$

8.4. The sum of a number and 23 is 78 $x + 23 = 78$

8.5. The width of a rectangle is 4 inches less than the length. The perimeter is 56. $P = 2w + 2L$ $56 = 2(L - 4) + 2w$

8.6. If a number is decreased by 6, and the result is multiplied by 3, then the answer is 15. $3(x - 6) = 15$

9. Write an equation to model each problem and then solve the problem.

9.1. Joelle had \$12 to spend on 7 pencils. After buying them she had \$1.50 left. How much did each pencil cost?

$$12 - 7 \cdot p = 1.50$$

$p =$ price of pencil
 $p = \$1.50$

9.2. Marla bought seven plants for her apartment. Two weeks later half of her plants had died from the heat. There are now only 12 plants left. With how many plants did Marla start?

$$(N + 7) - \frac{1}{2}(N + 7) = 12$$

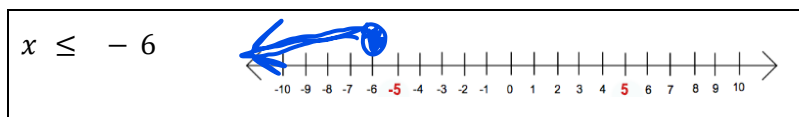
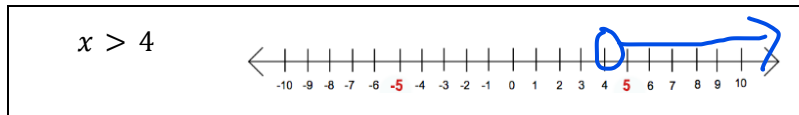
$N =$ starting # plants
 $N = 17$

9.3. Coral spent half of her weekly allowance playing mini-golf. To earn more money her parents let her wash the car for \$4. What is her weekly allowance if she ended with \$12

$$w - \frac{1}{2}w + 4 = 12$$

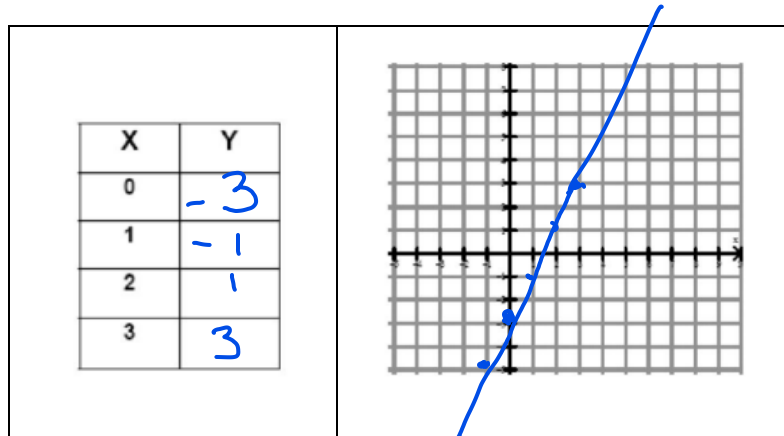
$w =$ weekly allowance
 $w = \$16$

10. Graph each of the following inequalities on the number line.

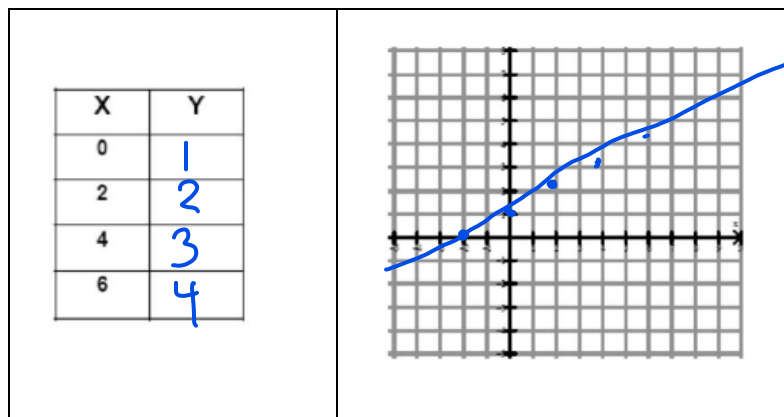


11. Fill in the table. Sketch the graph of the given line.

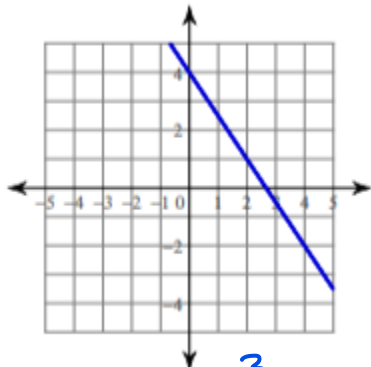
11.1 $y = 2x - 3$



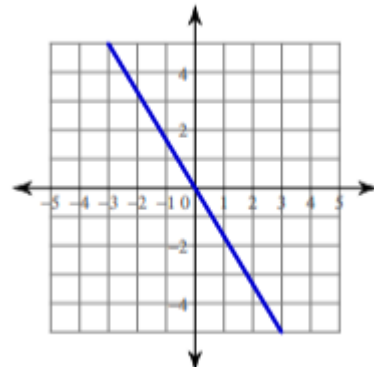
11.2 $y = \frac{1}{2}x + 1$



12. Write the slope intercept form of the equation of each line.



$$y = -\frac{3}{2}x + 4$$



$$y = -2x$$

13. Simplify. Your answer should contain only positive exponents.

13.1. $\frac{x^{-2}}{3x^{-3}y^2}$

$$\frac{x}{3y^2}$$

13.2. $n^2 n^0 \cdot n^0$

$$n^2$$

13.3. $m^{-4} m^2$

$$m^{-2} = \frac{1}{m^2}$$

13.4. $u^3 v^2 (uv^2)^3$

$$u^6 v^8$$

13.5. $\frac{r^{-2}}{4r^5 4r^5}$

$$\frac{1}{16r^{12}}$$