

Algebra 12 Summer Packet

(For students entering Algebra 12)

Students entering Algebra 12 should complete the problems in this packet before returning to school. **Students will be held responsible for reviewing these concepts by their Algebra 12 teacher.** The first full day of school questions will be answered on the packet. The second class period an assessment on the packet will be administered.

Answers to all problems are included on the last page of this packet.

Need help on some of the topics? For each section a link to an instructional video has been provided!

Have a great summer and see you in the fall! 😊

Standard: Solve linear equations in one variable (8.EE.8)

Solving simple equations: https://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/equations_beginner/v/simple-equations

Solving equations: <https://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/basic-equation-practice/v/equations-3>

Linear equations word problems: <https://www.khanacademy.org/math/algebra-basics/core-algebra-linear-equations-inequalities/core-algebra-linear-equation-word-problems/v/linear-equation-word-problem-example>

Solve for the given variable.

1. $x - 6 = -10$

2. $10 - 2c = 18$

3. $8x - 2 = -9 + 7x$

4. $6 = 1 - 2n + 5$

5. One cell phone plan charges \$15 per month plus \$0.30 per minute used. A second cell phone plan charges \$25 per month plus \$0.10 per minute used.

Write and solve an equation to find the number of minutes you must talk to have the same cost for both calling plans.

Standard: Solve linear equations with rational number coefficients where there is one solution, infinitely many solutions, or no solutions (8.EE.7)

Number of solutions: <https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-solving-equations/cc-8th-equation-solutions/v/number-of-solutions-to-linear-equations>

Solve for the given variable.

6. $p - 4 = -9 + p$

7. $9x - 7 = -7$

8. $5x + 3 = 6x + 3 - x$

Standard: Use the distributive property and collect like-terms when solving linear equations (8.EE.7b)

Distributive Property:

<https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-solving-equations/cc-8th-equations-distribution/v/equation-special-cases>

Solve for the given variable.

9. $12 = -4(-6x - 3)$

10. $-8 = -(x + 4)$

11. $5n + 34 = -2(1 - 7n)$

12. $2(4x - 3) - 8 = 4 + 2x$

Standard: Derive the equation $y = mx + b$ for a line given two distinct non-vertical points (8.EE.5)

Slope-Intercept Form:

<https://www.khanacademy.org/math/algebra/two-var-linear-equations-and-intro-to-functions/slope-intercept-form/v/graphing-a-line-in-slope-intercept-form>

Write an equation in slope-intercept form ($y = mx + b$) of the line passing through the given points.

13. (3, 5) and (0, 4)

14. (2, 6) and (-4, -2)

15. (1, -1) and (6, 14)

Standard: Determine the rate of change (slope) and initial value of a function from a description of a relationship or from two (x, y) values (8.F.4)

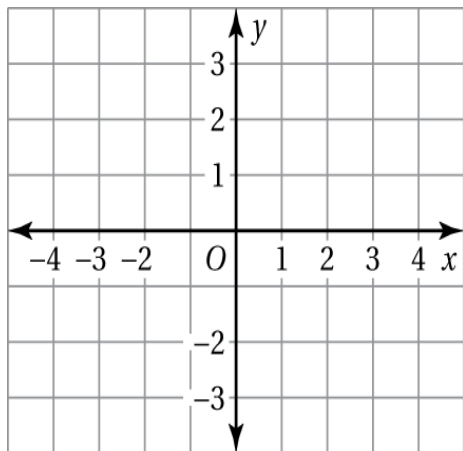
Standard: Interpret slope as the unit rate of the graph (8.EE.5)

Slope: <https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-linear-equations-functions/8th-slope/v/slope-intuition-example>

16. Find the slope of the line containing the points $(0, -1)$ and $(5, 6)$

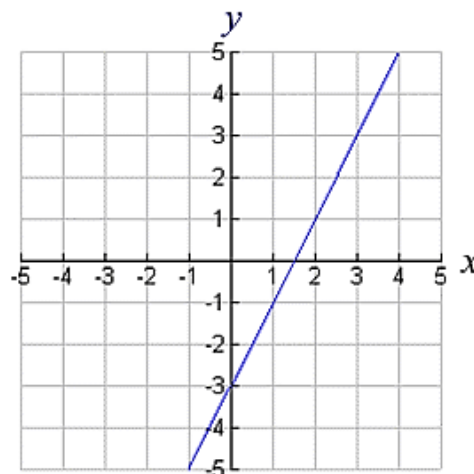
17. $y = 3x - 2$ Slope: _____ y-intercept: _____

Create a graph of the linear function.



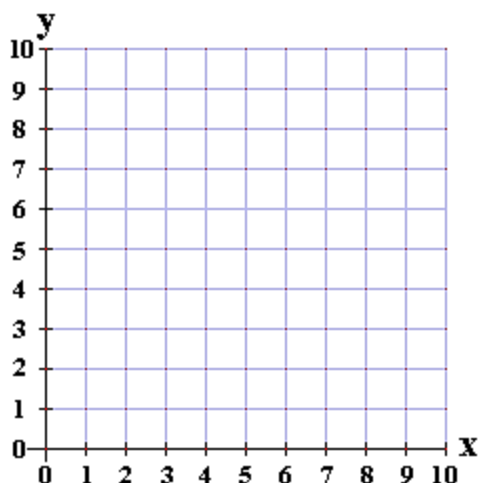
18. When Phil started his new job, he owed the company \$65 for his uniforms. He is earning \$13 per hour. The cost of his uniforms is withheld from his earnings. Write an equation that models the total money he has m after h hours of work.

19. What is the slope of the line? What is the y-intercept?



20. The table shows the cost y (in dollars) of x cold drinks.

Drinks, x	0	2	4	6
Cost, y	0	3	6	9



a. Graph the data. Label the axes.

b. What is the slope of the linear function? Interpret the slope in context of the situation.

c. What is the y-intercept of the linear function? Interpret the y-intercept in context of the situation.

Standard: Apply properties of integer exponents to generate equivalent numerical expressions(8.EE.1)

Exponent properties: <https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-numbers-operations/cc-8th-exponent-properties/v/exponent-properties-involving-products>

Negative Exponents: <https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-numbers-operations/cc-8th-pos-neg-exponents/v/negative-exponents>

Simplify each expression by using the properties of exponents.

21. $(x^3)^4$

22. $x^2 \cdot x^3$

23. $\frac{x^7}{x^3}$

24. x^{-2}

Standard: Use square and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$ (8.EE.2)

Square roots: <https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-numbers-operations/cc-8th-roots/v/understanding-square-roots>

Simplify each expression.

25. $\sqrt{36}$

26. $\sqrt{121}$

27. $\sqrt{81} + 15$

28. $6 - 5\sqrt{\frac{4}{25}}$

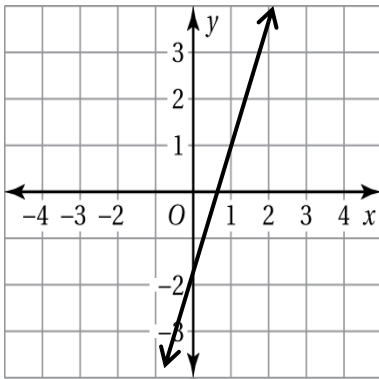
ANSWERS:

1. $x = -4$
2. $c = -4$
3. $x = -7$
4. $n = 0$
5. $15 + 0.30x = 25 + 0.10x$; 50 minutes
6. No solution
7. One solution
8. Infinite solutions
9. $x = 0$
10. $x = 4$
11. $n = 4$
12. $x = 3$
13. $y = \frac{1}{3}x + 4$
14. $y = \frac{4}{3}x + \frac{10}{3}$
15. $y = 3x - 4$
16. $\frac{7}{5}$
17. Slope = 3, y-int. = -2

20.b) Slope = $\frac{3}{2} = 1.5$; cost increases by \$1.50 per drink

c) y-int = 0; 0 drinks would cost \$0

21. x^{12}
22. x^5
23. x^4
24. $\frac{1}{x^2}$
25. 6
26. 11
27. 24
28. 4



18. $m = 13h - 65$
19. Slope = 2, y-int = -3
- 20.a)

