

Summer Work for Algebra 1

Name: _____

Operations with integers

<https://www.khanacademy.org/math/algebra-basics/core-algebra-foundations/core-algebra-foundations-negative-numbers/v/adding-and-subtracting-negative-number-examples>

<https://www.khanacademy.org/math/algebra-basics/core-algebra-foundations/core-algebra-foundations-negative-numbers/v/multiplying-positive-and-negative-numbers>

Simplify the following:

1. a. $(-1)+(-4)$ b. $4 + (-6)$ c. $2 - 5$ d. $-6 - (-3)$

2. a. $(-3)(-16)$ b. $(5)(-20)$ c. $\frac{-100}{10}$ d. $\frac{-45}{-9}$

Simplifying Fractions

Reduce the following fractions:

3. a. $\frac{4}{6}$ b. $\frac{-4}{-9}$ c. $\frac{15}{25}$ d. $\frac{4}{12}$

Converting Fractions to Decimals

<https://www.khanacademy.org/math/algebra-basics/core-algebra-foundations/algebra-foundations-decimal-operations/e/converting-fractions-to-decimals>

4. ***Rename the following fractions as a decimal:***

a. $\frac{1}{4}$ _____ b. $\frac{3}{4}$ _____ c. $\frac{1}{2}$ _____

d. $\frac{3}{2}$ _____ e. $\frac{1}{8}$ _____ d. $\frac{3}{8}$ _____

Converting Decimals to Fractions

<https://www.khanacademy.org/math/algebra-basics/core-algebra-foundations/algebra-foundations-decimal-operations/v/converting-decimals-to-fractions-1-ex-3>

5. *Rename the following decimals as fractions in reduced form:*

- a. 0.02 _____ b. 0.6 _____ c. 1.2 _____ d. 0.75 _____

Percentages

<https://www.khanacademy.org/math/algebra-basics/core-algebra-foundations/algebra-foundations-decimal-operations/v/finding-percentages-example>

6. *Change the following decimals or fractions to a percent:*

- a. .25 _____ b. $\frac{1}{2}$ _____ c. .9 _____ d. $\frac{35}{100}$ _____ e. $\frac{1}{5}$ _____

Change the following percents to decimals:

- d. 40% _____ e. .5% _____ f. 120% _____

Rounding

7. a. Round 4.3228 to the nearest hundredth. _____

b. Round 86.8954776543 to the nearest millionth. _____

Evaluating Expressions:

<https://www.khanacademy.org/math/algebra/introduction-to-algebra/variable-and-expressions/v/evaluate-a-formula-using-substitution>

8. *Evaluate the following expressions and then simplify. Let $a=8$ and $b=-2$.*

- a. ab b. $a-b$ c. $\frac{a}{b}$ d. $-2a^2 - a - 4$

Writing Algebraic expressions:

<https://www.khanacademy.org/math/algebra/introduction-to-algebra/writing-expressions-tutorial/v/writing-expressions-1>

9. *Write the following sentences as algebraic expressions:*

- a. the sum of 3 and a number x .
- b. 3 less than a number y .
- c. the product of 6 and the sum of five and a number.

Combining Like Terms

<https://www.khanacademy.org/math/algebra/introduction-to-algebra/manipulating-expressions/v/combining-like-terms-1>

10. *Simplify the following expressions:*

- a. $7a + 2a$
- b. $8x - 10x$
- c. $6ab + 3ba$
- d. $5c - 6c + 8c - 9c$

Order of Operations

<https://www.khanacademy.org/math/algebra-basics/core-algebra-foundations/algebra-foundations-order-of-operations/v/introduction-to-order-of-operations>

11. *Simplify the following expressions by applying the order of operations:*

- a. $2 + 7 \cdot 4$
- b. $8 - 35 \div 7$
- c. $6(2) + 12 \div 3(2)$
- d. $4(2 - 3(4 + 5(2 - 5) + 5))$
- e. $\frac{32-4^2}{2-4}$
- f. $(-3)^2$
- g. -3^2

- f. Add parentheses to make the sentence true: $48 \div 2 \cdot 4$

Prime Factorization:

<https://www.khanacademy.org/math/pre-algebra/factors-multiples/prime-factorization/v/prime-factorization>

12. *Using a factor tree find the prime factors for the following:*

- a. 24 b. 18 c. 32 d. 100

Greatest Common Factor

<https://www.khanacademy.org/math/pre-algebra/factors-multiples/greatest-common-divisor/v/greatest-common-divisor>

13. *Find the greatest common factor between the following numbers.*

- a. 3 and 18 b. 24, 36, and 48 c. 112 and 98

Least Common Multiple

<https://www.khanacademy.org/math/pre-algebra/factors-multiples/least-common-multiple/v/least-common-multiple-exercise>

14. *Find the least common multiple between the following numbers:*

- a. 12 and 18 b. 3, 6, and 8 c. 10, 20, and 50

Square Roots

<https://www.khanacademy.org/math/algebra-basics/core-algebra-foundations/square-roots-for-college/v/understanding-square-roots>

15. *Evaluate the following square roots:*

- a. $\sqrt{36}$ b. $-\sqrt{25}$ c. $\sqrt{\frac{9}{4}}$

Simplifying Absolute Value Expressions

<https://www.khanacademy.org/math/pre-algebra/negatives-absolute-value-pre-alg/abs-value-pre-alg/v/absolute-value-of-integers>

16. *The absolute value of a number is its distance from 0 on a number line. Find the absolute value of each of the following:*

a. $|-5|$

b. $|2 - 5|$

c. $|-5 - 3|$

d. $|-5 - (-6)|$

Operations with fractions:

<https://www.khanacademy.org/math/pre-algebra/fractions-pre-alg/fractions-unlike-denom-pre-alg/v/adding-and-subtracting-fractions>

https://www.khanacademy.org/math/arithmetric/fractions/multiplying_fractions/v/multiplying-fractions

<https://www.khanacademy.org/math/arithmetric/fractions/div-fractions-fractions/v/another-dividing-fractions-example>

<https://www.khanacademy.org/math/pre-algebra/fractions-pre-alg/comparing-fractions-pre-alg/v/comparing-fractions>

17. *Add or subtract the following and then simplify:*

a. $\frac{2}{3} + \frac{5}{6}$

b. $-\frac{1}{4} + (-\frac{5}{8})$

c. $\frac{5}{16} - \frac{3}{8}$

18. *Multiply or divide the following and then simplify:*

a. $\frac{2}{3} \cdot \frac{5}{6}$

b. $-\frac{4}{3} \cdot \frac{6}{7}$

c. $-\frac{1}{3} \cdot (-\frac{5}{6})$

d. $\frac{\frac{5}{7}}{\frac{10}{11}}$

19. *Compare the following fractions using: $>$, $<$, \geq , \leq*

a. $\frac{3}{4}, \frac{7}{8}$

b. $\frac{3}{8}, \frac{1}{3}$

c. $-\frac{7}{12}, -\frac{3}{8}$

Exponents

<https://www.khanacademy.org/math/pre-algebra/exponents-radicals/World-of-exponents/v/introduction-to-exponents>

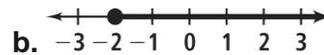
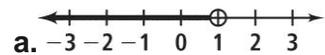
20. a. How can you rewrite $6 \cdot 6 \cdot 6$ as an exponential expression?

b. How do you write x^4 in expanded form?

Inequalities

<https://www.khanacademy.org/math/pre-algebra/applying-math-reasoning-topic/greater-than-less-than/v/plotting-inequalities-on-a-number-line>

21. *Write an inequality for each graph.*



22. *Graph each inequality on a number line.*

a. $y < -2$

b. $t \geq 4$

c. $z > -3$

d. $v \leq 15$

Sets of Numbers

23. Please **define** the following and **give an example of a number that belongs to each set**

a. natural numbers:

b. whole numbers:

c. integers:

d. rational numbers:

e. irrational numbers:

f. real numbers:

Properties of real numbers:

24.

a. *Describe the commutative property:*

b. *Which operations (+, -, *, ÷) are commutative:*

c. *Describe the associative property:*

25. *Name the property (either commutative or associative) illustrated by the following statements:*

a. $12 + 917 = 917 + 12$

b. $3 \cdot (4 \cdot 6) = (3 \cdot 4) \cdot 6$

26. *Simplify the following expressions by applying the distributive property:*

a. $2(x + 7)$

b. $-5(3x - 9)$

c. $-(10x + 3)$

One and Two step equations:

<https://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-variables-expressions/cc-7th-2-step-equations/v/why-we-do-the-same-thing-to-both-sides-two-step-equations>

27. *Solve the following Equations:*

a. $6 = p - 8$

b. $z + 5 = 4$

c. $-25 = -5x$

d. $25 = \frac{z}{-4}$

e. $\frac{3}{4}b = 15$

f. $-8 = \frac{2}{5}t$

g. $4x + 5 = 13$

h. $-8 + 3h = 1$

i. $\frac{n}{-8} - 5 = -2$

j. $13 + \frac{a}{11} = 7$

Setting up and solving proportions

<https://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-ratio-proportion/cc-7th-write-and-solve-proportions/v/writing-proportions>

28. *Solve the following proportions:*

a. $\frac{-13}{15} = \frac{k}{-5}$

b. $\frac{-14}{h} = \frac{-2}{5}$

c. $\frac{2}{j+3} = \frac{4}{5}$

d. $\frac{15-b}{6} = \frac{-2}{3}$

Set up a proportion and solve for the missing quantity:

e. Jennifer is ordering cake for her wedding reception. If one cake will feed 18 people, how many cakes does she need to order for 150 people?

Graphing Points and Equations

<https://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-negative-number-topic/cc-6th-coordinate-plane/v/plot-ordered-pairs>

29. *Identify the ordered pairs on the graph to the right:*

A=

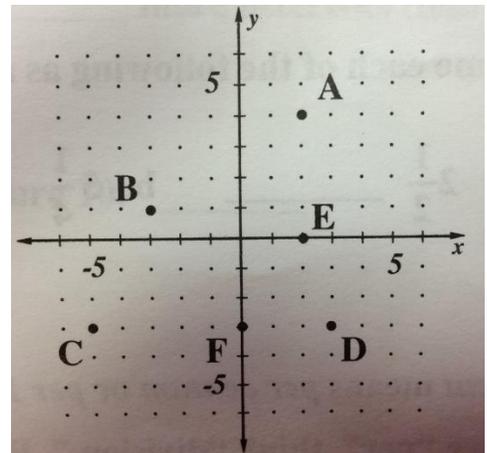
B=

C=

D=

E=

F=



Slope formula: for any two coordinates (x_1, y_1) (x_2, y_2)

$$\text{Slope} = m = \frac{y_2 - y_1}{x_2 - x_1}$$

33. Find the slope of the line that passes through each pair of points.

a. $(-4, 5), (1, 1)$

b. $(0, 0), (-1, 3)$

Area and Perimeter

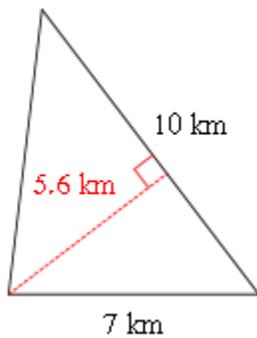
<https://www.khanacademy.org/math/basic-geo/basic-geo-area-perimeter/basic-geo-area-perimeter-polygon/v/triangle-area-proofs>

<https://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-geometry/cc-7th-area-circumference/v/circles-radius-diameter-and-circumference>

<https://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-geometry/cc-7th-area-circumference/v/area-of-a-circle>

34. Find the area and perimeter of the figures below:

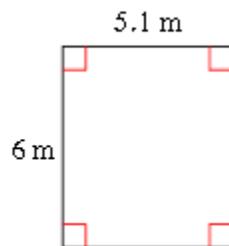
a.



A=

P=

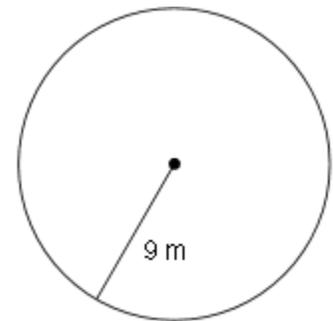
b.



A=

P=

c.



A=

Circumference=