

Basic algebra test solution

1. What is the product of -4 and +6? _____

$$-4 \times 6$$

Rules for multiplying integers:

- a. If the numbers have the same sign, just multiply the numbers and the sign of the answer is +
- b. If the numbers have different signs, the sign of the answer is -

Here the numbers have different signs, the sign of the answer is -

$$-4 \times 6 = -24$$

2. Add: -5 + 7 _____

$$-5 + 7$$

Rules for adding integers:

- a. If the numbers have the same sign, just add and keep the same sign
- b. If the numbers have different signs, just follow the steps below

Step 1: Find the absolute value of the numbers

Step 2: After you get the absolute value of the numbers, do the math below.

bigger number – smaller number

Step 3: Keep the sign of the integer that has the greater absolute value.

Here the numbers have different signs, so we will follow step 1 through 3

Step 1: Find the absolute value of the numbers

$$|-5| = 5$$

$$|7| = 7$$

Step 2: After you get the absolute value of the numbers, do the math below that is subtract the smaller number from the bigger.

$$\text{bigger number} - \text{smaller number} = 7 - 5 = 2$$

Step 3: Keep the sign of the integer that has the greater absolute value.

The integer that has the greater absolute value is 7 , so the answer is positive

$$-5 + 7 = 2$$

3. What is the quotient of 56 and -2? _____

$$56 / -2$$

Rules for dividing integers:

a. If the numbers have the same sign, just divide the numbers and the sign of the answer is +

b. If the numbers have different signs, the sign of the answer is -

Here the numbers have different signs, the sign of the answer is -

$$56 / -2 = -28$$

4. Subtract: $-7 - -2$ _____

Rules for subtracting integers:

Turn the minus sign between -7 and -2 into a $+$

Then take the opposite of the number on the right of the minus sign that -2

We get $-7 + 2$

Then follow the steps outlined below for adding integers

a. If the numbers have the same sign, just add and keep the same sign

b. If the numbers have different signs, just follow the steps below

Step 1: Find the absolute value of the numbers

Step 2: After you get the absolute value of the numbers, do the math below.

bigger number $-$ smaller number

Step 3: Keep the sign of the integer that has the greater absolute value.

Here the numbers have different signs, so we will follow step 1 through 3

Step 1: Find the absolute value of the numbers

$$|-7| = 7$$

$$|-2| = 2$$

Step 2: After you get the absolute value of the numbers, do the math below that is subtract the smaller number from the bigger.

$$\text{bigger number} - \text{smaller number} = 7 - 2 = 5$$

Step 3: Keep the sign of the integer that has the greater absolute value.

The integer that has the greater absolute value is -7, so the answer is negative

$$-7 + 2 = -5$$

5. Multiply -6 and -8 _____

$$-6 * -8$$

Rules for multiplying integers:

a. If the numbers have the same sign, just multiply the numbers and the sign of the answer is +

b. If the numbers have different signs, the sign of the answer is -

Here the numbers have the same sign, the sign of the answer is +

$$-6 * -8 = 48$$

6. Which set of integers is arranged from greatest to least? _____

- A.** -5, -2, -1, 2 **B.** -2, -5, -1, 2 **C.** 2, -1, -2, -5 **D.** 2, -5, -2, -1

A.

-5, -2, -1, 2. This set does not work since -5 is smaller than -2

B.

-2, -5, -1, 2. This set does not work since -5 is smaller than -1

C.

2, -1, -2, -5. This set works since 2 is bigger than -1, -1 is bigger than -2, and -2 is bigger than -5

D.

2, -5, -2, -1 This set does not work since -5 is not bigger than -2

7. What is the value of $8x - 6$ when x is equal to -1? _____

$$8x - 6 = 8 \times x - 6$$

$$= 8 \times -1 - 6$$

$$= -8 - 6$$

$$= -14$$

8. What is the value of $5a + 2b$ when $a = 2$ and $b = 6$? _____

$$5a + 2b = 5 \times a + 2 \times b$$

$$= 5 \times 2 + 2 \times 6$$

$$= 10 + 12$$

$$= 22$$

9. What is the value of $b^2 - 5$ when $b = 5$? _____

$$b^2 - 5 = b \times b - 5$$

$$= 5 \times 5 - 5$$

$$= 25 - 5$$

$$= 20$$

10. What is the value of $(a^2 + x)/y$ when $a = 4$, $x = 6$ and $y = 2$? _____

$$\frac{a^2 + x}{y} = \frac{a \times a + x}{y}$$

$$= \frac{4 \times 4 + 6}{2}$$

$$= \frac{16 + 6}{2}$$

$$= \frac{22}{2}$$

$$= 11$$

11. Choose the right expression or equation that best represents the mathematical statement:

Twice a number plus 6 is twelve.

- A.** $\frac{1}{2}x + 6 = 12$ **B.** $2x - 6 = 12$ **C.** $2x + 6 = 12$ **D.** $3x + 6 = 12$

Let x be a number. Twice the number is equivalent to $2 \times x$

Twice a number plus 6 is equivalent to $2 \times x + 6$

Twice a number plus 6 is twelve is equivalent $2 \times x + 6 = 12$

12. The product of three times a number and 9 _____

- A.** $27x$ **B.** $9x$ **C.** $3x + 9$ **D.** $39x$

Let x be a number.

The product of three times a number is equivalent to $3 \times x$

The product of three times a number and 9 is equivalent to $3 \times x + 9 = 3x + 9$

The answer is C.

13. Solve for x: $2x - 5 = 11$ _____

Add 5 to both sides

$$2x - 5 + 5 = 11 + 5$$

Do the math for $- 5 + 5$ and $11 + 5$

$$- 5 + 5 = 0$$

$$11 + 5 = 16$$

Rewrite the equation

$$2x + 0 = 16$$

$$2x = 16$$

Divide both sides of $2x = 16$ by 2

$$\frac{2x}{2} = \frac{16}{2}$$

The expressions above is also equal to

$$\frac{2}{2}x = \frac{16}{2}$$

$$\text{Since } \frac{2}{2} = 1 \quad \text{and} \quad \frac{16}{2} = 8$$

We can rewrite the equation as

$$1x = 8$$

The answer is

$$x = 8$$

14. Solve for x: $2x - 5 = 15$

Rewrite the equation

$$2x + 5 = 15$$

Subtract 5 from both sides

$$2x + 5 - 5 = 15 - 5$$

Do the math for $5 - 5$ and $15 - 5$

$$5 - 5 = 0$$

$$15 - 5 = 10$$

Rewrite the equation

$$2x + 0 = 10$$

$$2x = 10$$

Divide both sides of $2x = 10$ by 2

$$\frac{2x}{2} = \frac{10}{2}$$

The expressions above is also equal to

$$\frac{2}{2}x = \frac{10}{2}$$

$$\text{Since } \frac{2}{2}=1 \quad \text{and} \quad \frac{10}{2} = 5$$

We can rewrite the equation as

$$1x = 5$$

The answer is

$$x = 5$$

15. Solve for x: $(-3/2)x - 4 = 13$

$$\frac{-3}{2}x - 4 = 13$$

Rewrite the equation

$$\frac{-3}{2}x + 4 = 13$$

Subtract 4 from both sides

$$\frac{-3}{2}x + 4 - 4 = 13 - 4$$

$$\frac{-3}{2}x + 4 - 4 = 13 - 4$$

$$\frac{-3}{2}x = 9$$

Multiply both sides by $\frac{-2}{3}$

$$\frac{-2}{3} \times \frac{-3}{2}x = 9 \times \frac{-2}{3}$$

$$\frac{6}{6}x = \frac{9}{1} \times \frac{-2}{3}$$

$$1x = \frac{-18}{3}$$

$$x = -6$$

The answer is B.

- 16.** My mother's age is three times my age. The sum of our ages is 40. How old am I? How old is my mom? (Hint: Let x be your age)

Let x be my age

My Mom's age is 3x

$$x + 3x = 40$$

$$4x = 40$$

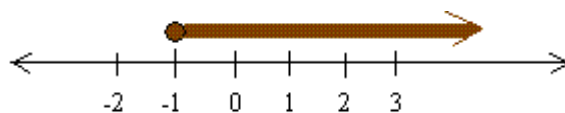
Divide both sides by 4

$$\frac{4}{4}x = \frac{40}{4}$$

$$x = 10$$

my age is 10 and my mom's age is $3 \times 10 = 30$

17. Which inequality represents the graph below:



A. $x \leq 3$ B. $x < 4$ C. $x \leq -1$ D. $x \geq -1$

We see that everything is shaded on the right side of -1.

All numbers on the right side of -1 are bigger than -1

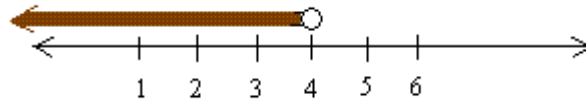
Let x represents all numbers on the right side of -1

$$x > -1$$

However, since -1 is also shaded, x is also equal to -1

$$x \geq -1$$

18. Which inequality represents the graph below:



A. $x \leq 4$

B. $x < 1$ C.

$x < 4$ D.

$x > 2$

We see that everything is shaded on the left side of 4.

All numbers on the left side of 4 are smaller than 4

Let x represents all numbers on the left side of 4

$x < 4$

We see also that 4 is not shaded, so x is not equal to 4

$x < 4$

19. Which inequality represents the graph below:



A. $-5 \leq x \leq 0$

B. $-5 < x < 0$

C. $-5 < x \leq 0$

D. $-5 \leq x < 0$

See see that x is bigger or equal -5 . We can write $x \geq -5$ or $-5 \leq x$

We see that $x < 0$

Combining these two inequalities $-5 \leq x$ and $x < 0$ give $-5 \leq x < 0$

The answer is **D**.

20. Solve and graph the following inequality: $2x + 5 > 12$

$$2x + 5 > 12$$

$$2x + 5 - 5 > 12 - 5$$

$$2x + 0 > 7$$

$$2x > 7$$

$$\frac{2}{2}x > \frac{7}{2}$$

$$x > 3.5$$

