

ELEMENTARY ALGEBRA

This practice test measures your ability to perform basic algebraic operations and to solve problems that involve elementary algebraic concepts.

Directions: Solve each of the following problem in the space to the right of the question as provided and indicate your answer by circling it.

1. $-3(x-7) =$

- (A) $-3x - 21$
- (B) $-3x - 7$
- (C) $-3x + 10$
- (D) $-3x + 21$

2. $(2x^4y)(5x^3y) =$

- (A) $10x^7y^2$
- (B) $7x^7y^2$
- (C) $10x^{12}y^2$
- (D) $7x^{12}y^2$

3. If $6x = 5 - 9x$
then $x =$

- (A) $-\frac{5}{3}$
- (B) $-\frac{1}{3}$
- (C) $\frac{1}{3}$
- (D) $\frac{5}{3}$

4. A factored form of
 $1 - 16a^2$ is

- (A) $(1+4a)(1+4a)$
- (B) $(1-4a)(1-4a)$
- (C) $(1-4a)(1+4a)$
- (D) $(1-16a)(1+a)$

5. If $15 - 4y = 12$, then $y =$

- (A) $-\frac{27}{4}$
- (B) $\frac{3}{4}$
- (C) $\frac{4}{3}$
- (D) $\frac{27}{4}$

6. If $a = 5$ and $b = -2$, then

$$\frac{ab - 6}{3b^2} =$$

- (A) $-\frac{4}{3}$
- (B) $-\frac{1}{3}$
- (C) $\frac{1}{3}$
- (D) $\frac{4}{3}$

7. The sum of two numbers
is 42. If one number is x ,
then in terms of x , the
other number is

- (A) $42 - x$
- (B) $x - 42$
- (C) x
- (D) $2x$

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8. If $6x - 2 = 12x + 7$,
then $x =$

- (A) $-\frac{1}{3}$
(B) $-\frac{2}{3}$
(C) $-1\frac{1}{2}$
(D) $\frac{2}{3}$

9. $(5x^4)^3 =$

- (A) $15x^{12}$
(B) $125x^7$
(C) $125x^{12}$
(D) $125x^{64}$

10. $(x+3y)^2 =$

- (A) $x^2 + 3y^2$
(B) $x^2 + 9y^2$
(C) $x^2 + 3xy + 9y^2$
(D) $x^2 + 6xy + 9y^2$

11. Which of the following is
a factor of
 $x^2 - 7x + 10$?

- (A) $x + 2$
(B) $x - 2$
(C) $x + 10$
(D) $x + 5$

12. Arty downloaded 45 apps
per hour for t hours. In
terms of t , what number
of apps did he download?

- (A) $\frac{45}{t}$
(B) $\frac{t}{45}$
(C) $45t$
(D) $45+t$

13. One of the solutions to
the equation

$$3x^2 - 10x - 8 = 0$$
 is

- (A) $\frac{2}{3}$
(B) $1\frac{1}{3}$
(C) $-\frac{2}{3}$
(D) $-1\frac{1}{3}$

14. $9\sqrt{3} + 6\sqrt{3} - \sqrt{3} =$

- (A) 15
(B) $14\sqrt{3}$
(C) $15\sqrt{3}$
(D) $15\sqrt{6} - \sqrt{3}$

15. If $\frac{1}{x} + 3 = \frac{1}{2}$, then $x =$

- (A) $\frac{5}{3}$
(B) $-\frac{2}{5}$
(C) $-\frac{2}{3}$
(D) $-\frac{3}{2}$

16. $\frac{x}{8} + \frac{3x}{7} =$

- (A) 56
- (B) $\frac{10x}{23}$
- (C) $\frac{31x}{56}$
- (D) $\frac{4x}{15}$

17. The length of a rectangle is 7 inches greater than its width. Which of the following expressions represents its area in terms of its width, w ?

- (A) $2w(w+7)$
- (B) $2(2w+7)$
- (C) $2(w+7)$
- (D) $w(w+7)$

18. If $x^2 - 9x + 25$ is divided by $x - 4$, the remainder is

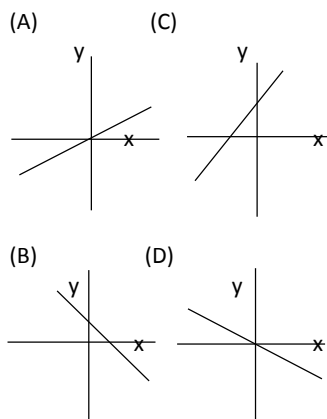
- (A) 0
- (B) 5
- (C) 20
- (D) 25

19. If $\frac{5}{2}x - 6 = \frac{3}{5}x$,

then $x =$

- (A) $7\frac{2}{5}$
- (B) $\frac{3}{5}$
- (C) $-\frac{7}{5}$
- (D) $\frac{60}{19}$

20. Which of the following could represent the graph $3x = y$?



21. $(3\sqrt{4b})^2 =$

- (A) $6\sqrt{4b}$
- (B) $12\sqrt{b}$
- (C) $18b$
- (D) $36b$

$$\begin{cases} x + 3y = 6 \\ 2x - 5y = 10 \end{cases}$$

22. In the solution of the system of equations above, what is the value of y ?

- (A) $\frac{2}{11}$
- (B) -1
- (C) $\frac{2}{5}$
- (D) $5\frac{5}{11}$

23. If $\frac{x+3}{2} = \frac{3x-4}{3}$,
then $x =$

(A) $\frac{17}{3}$

(B) $\frac{1}{2}$

(C) $\frac{17}{9}$

(D) $\frac{1}{3}$

24. If $ax - b = cx - e$,
then $x =$

(A) $\frac{b-e}{ac}$

(B) $\frac{b+e}{a+c}$

(C) $\frac{b-e}{a-c}$

(D) $\frac{b-e}{ac}$

25. $\frac{a}{a-a^2} =$

(A) $-\frac{1}{a^2}$

(B) $\frac{1}{1-a}$

(C) $\frac{1}{1-a^2}$

(D) $1 - \frac{1}{a^2}$

26. $5b^3 + 3b^2 - (2b^2 - 4)$

(A) $5b^3 + 5b^2 - 4$

(B) $5b^3 + 5b^2 + 4$

(C) $5b^3 - b^2 - 4$

(D) $5b^3 + b^2 + 4$

27. $\frac{1}{x} - \frac{1}{y} =$

(A) 0

(B) $\frac{1}{x-y}$

(C) $\frac{y-x}{xy}$

(D) $\frac{-xy}{xy}$

STOP!

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This practice test measures your ability to perform basic algebraic operations and to solve problems that involve elementary algebraic concepts.

Directions: Solve each of the following problem in the space to the right of the question as provided and indicate your answer by circling it.

<p>1. $-3(x-7) =$</p> <p>(E) $-3x-21$ (F) $-3x-7$ (G) $-3x+10$ (H) $-3x+21$</p> <p>2. $(2x^4y)(5x^3y) =$</p> <p>(E) $10x^7y^2$ (F) $7x^7y^2$ (G) $10x^{12}y^2$ (H) $7x^{12}y^2$</p> <p>3. If, $6x = 5 - 9x$ then $x =$</p> <p>(E) $-\frac{5}{3}$ (F) $-\frac{1}{3}$ (G) $\frac{1}{3}$ (H) $\frac{5}{3}$</p> <p>4. A factored form of $1-16a^2$ is</p> <p>(E) $(1+4a)(1+4a)$ (F) $(1-4a)(1-4a)$ (G) $(1-4a)(1+4a)$ (H) $(1-16a)(1+a)$</p>	<p>Apply the distributive law of multiplication & watch your "signs".</p> $-3x+21$ <p>Multiply: remember that exponents <u>add</u> when you multiply this.</p> $10x^7y^2$ $6x = 5 - 9x$ $+ 9x \quad + 9x$ $15x = 5$ $x = \frac{5}{15}$ $x = \frac{1}{3}$ <p>Thinking of the Reverse FOIL method (factoring), you'll need the "Outside & Inside" multiplicands to "cancel out" for this result:</p> $(1+4a)(1-4a) =$ $1-4a+4a+16a^2 =$ $1-16a^2$	<p>5. If $15 - 4y = 12$, then $y =$</p> <p>(E) $-\frac{27}{4}$ (F) $\frac{3}{4}$ (G) $\frac{4}{3}$ (H) $\frac{27}{4}$</p> <p>6. If $a = 5$ and $b = -2$, then $\frac{ab-6}{3b^2} =$</p> <p>(E) $-\frac{4}{3}$ (F) $-\frac{1}{3}$ (G) $\frac{1}{3}$ (H) $\frac{4}{3}$</p> <p>7. The sum of two numbers is 42. If one number is x, then in terms of x, the other number is</p> <p>(E) $42-x$ (F) $x-42$ (G) x (H) $2x$</p>	$15-4y = 12$ $-15 \quad -15$ $-4y = -3$ $y = \frac{-3}{-4}$ $y = \frac{3}{4}$ $\frac{ab-6}{3b^2} = \frac{[(5)(-2)-6]}{3(-2)^2}$ $\frac{-10-6}{3(4)} = \frac{-16}{12}$ $= -\frac{4}{3}$ <p>To make it easier for you, let the unknown number or "other number" be represented by "y".</p> <p>Therefore:</p> $x + y = 42$ <p>Now solve for y:</p> $y = 42 - x$ <p>GO ON TO THE NEXT PAGE</p>
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8. If $6x - 2 = 12x + 7$,
then $x =$

(E) $-\frac{1}{3}$

(F) $-\frac{2}{3}$

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(H) $\frac{2}{3}$

9. $(5x^4)^3 =$

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(F) $\frac{t}{45}$

(G) $45t$

(H) $45+t$

$$\begin{array}{r} 6x - 2 = 12x + 7 \\ -6x \quad -6x \\ -2 = 6x + 7 \\ -7 \quad -7 \\ -9 = 6x \\ x = -1\frac{1}{2} \end{array}$$

Multiply it 3 times:

$$\begin{aligned} (5x^4)^3 &= \\ (5x^4)(5x^4)(5x^4) &= \\ 125x^{12} & \end{aligned}$$

Remember that exponents
add when you multiply this.

Use the FOIL method:

$$\begin{aligned} (x+3y)(x+3y) &= \\ x^2 + 3xy + 3xy + 9y^2 &= \\ x^2 + 6xy + 9y^2 & \end{aligned}$$

Use the reverse FOIL
method (factoring):

$$\begin{aligned} (x-5)(x-2) &= \\ x^2 - 2x - 5x + 10 &= \\ x^2 - 7x + 10 & \end{aligned}$$

Rate = 45 apps per hour

$$\text{Rate} = \frac{45 \text{ apps}}{\text{hour}}$$

of hours = time (t hour)

Multiply by number of
hours to give number of
apps.

$$\frac{45 \text{ apps}}{\text{hour}} (t \text{ hour}) = 45t \text{ apps}$$

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Use the reverse FOIL method
(factoring):

$$(3x+2)(x-4) = 0$$

Solve each factor for x :

$$3x+2=0$$

$$3x=-2$$

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

$$x-4=0$$

$$x=4$$

$$\begin{aligned} 15\sqrt{3} - \sqrt{3} &= \\ 14\sqrt{3} & \end{aligned}$$

$$\begin{aligned} \frac{1}{x} + 3 &= \frac{1}{2} \\ -3 \quad -3 & \end{aligned}$$

$$\frac{1}{x} = \frac{1}{2} - 3$$

$$\frac{1}{x} = \frac{1}{2} - \frac{6}{2}$$

$$\frac{1}{x} = -\frac{5}{2}$$

Cross multiply & solve for x :

$$5x = -2$$

$$x = -\frac{2}{5}$$

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$\frac{x}{8} + \frac{3x}{7} =$

Find the least common denominator:

$\frac{7x}{56} + \frac{24x}{56} =$

$\frac{31x}{56}$

Area = $l \times w$

(l)ength = $w + 7$

(w)idth = w

Area = $w(w+7)$

1st:

Multiply

$x-5$
 $x-4 \sqrt{x^2 - 9x + 25}$
 Use the FOIL method:
 $x^2 - 4x - 5x + 20$

$x^2 - 9x + 20$
 2nd: Compare

Remainder: $25 - 20 = 5$

$\frac{5}{2}x - 6 = \frac{3}{5}x$

$-\frac{5}{2}x$ $-\frac{5}{2}x$

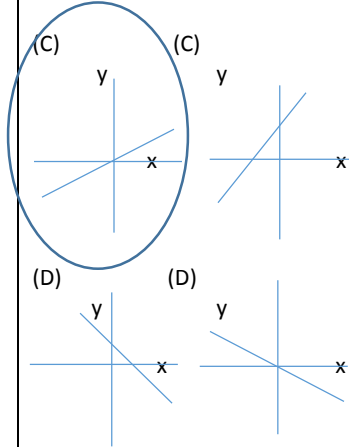
$-6 = \frac{3}{5}x - \frac{5}{2}x$

$-6 = \frac{6}{10}x - \frac{25}{10}x$

$-6 = -\frac{19}{10}x$

Cross multiply:

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22. In the solution of the system of equations above, what is the value of y ?

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(H) $5\frac{5}{11}$

Try some "test" coordinates

X	Y
0	0
1	3
2	6
3	9
-1	-3
-2	-6

So the line must pass through the (0,0) coordinate which eliminates answers (C) & (B). Since the values of X & Y are either both positive or both negative (D) cannot be the correct answer.

$(3\sqrt{4b})^2 =$
 $3\sqrt{4b} \cdot 3\sqrt{4b} =$
 $9\sqrt{16b^2} =$
 $9 \cdot 4b =$
 $36b$

Solve for x :
 $x + 3y = 6$
 $-3y$ $-3y$

$x = 6 - 3y$

Now substitute for X in:
 $2x - 5y = 10$

$2(6 - 3y) - 5y = 10$

Now solve for y :
 $12 - 6y - 5y = 10$
 $12 - 11y = 10$
 -12 -12
 $-11y = -2$
 $y = \frac{2}{11}$

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(H) $1 - \frac{1}{a^2}$

$60 = 19x; x = \frac{60}{19}$

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

Cross multiply & solve for x :

$3(x+3) = 2(3x-4)$

$3x+9 = 6x-8$

$+8 \quad +8$

$3x+17 = 6x$

$-3x \quad -3x$

$17 = 3x$

$x = \frac{17}{3}$

$ax - b = cx - e$
 $-cx \quad -cx$

$ax - cx - b = -e$
 $+b \quad +b$

$ax - cx = b - e$

$x(a - c) = b - e$

$x = \frac{b - e}{a - c}$

$\frac{a}{a - a^2} =$

$\frac{\cancel{a}}{\cancel{a}(1 - a)} =$

$\frac{1}{1 - a}$

26. $5b^3 + 3b^2 - (2b^2 - 4)$

(E) $5b^3 + 5b^2 - 4$

(F) $5b^3 + 5b^2 + 4$

(G) $5b^3 - b^2 - 4$

(H) $5b^3 + b^2 + 4$

27. $\frac{1}{x} - \frac{1}{y} =$

(E) 0

(F) $\frac{1}{x-y}$

(G) $\frac{y-x}{xy}$

(H) $\frac{-xy}{xy}$

$5b^3 + 3b^2 - (2b^2 - 4)$

$5b^3 + 3b^2 - 2b^2 + 4$

$5b^3 + b^2 + 4$

$\frac{1}{x} - \frac{1}{y}$

Find the least common denominator:

$\frac{y}{xy} - \frac{x}{xy} =$

$\frac{y-x}{xy}$

STOP!