

**Math Drill**

*Time yourself from start to finish and record your time below. The SAT Non-Calculator section is all about speed and practice makes perfect!*

YOUR TIME: \_\_\_\_\_

<b>Multiplication Facts to 100 (E)</b>
--

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_/100

Calculate each product.

$\begin{array}{r} 3 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 10 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 10 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 10 \\ \hline \end{array}$
$\begin{array}{r} 6 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 6 \\ \hline \end{array}$
$\begin{array}{r} 3 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 10 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 6 \\ \hline \end{array}$
$\begin{array}{r} 6 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 10 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ \times 10 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 2 \\ \hline \end{array}$
$\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 10 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 7 \\ \hline \end{array}$
$\begin{array}{r} 8 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ \times 9 \\ \hline \end{array}$
$\begin{array}{r} 5 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 6 \\ \hline \end{array}$
$\begin{array}{r} 9 \\ \times 10 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 10 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ \times 6 \\ \hline \end{array}$
$\begin{array}{r} 9 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ \times 10 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 10 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 8 \\ \hline \end{array}$
$\begin{array}{r} 8 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 10 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ \times 6 \\ \hline \end{array}$

## Unit 10 - Fundamentals of Algebra

Topic: Laws of Exponents and Scientific Notation

1

If  $(-a^2b^3)(2ab^2)(-3b) = ka^mb^n$ , what is the value of  $m+n$ ?

2

If  $(\frac{2}{3}a^2b)^2(\frac{4}{3}ab)^{-3} = ka^mb^n$ , what is the value of  $k$ ?

3

If  $\frac{(x)^3(-y)^2z^{-2}}{(x)^{-2}y^3z} = \frac{x^m}{y^nz^p}$ , what is the value of  $m+n+p$ ?

4

If  $2^x = 5$ , what is the value of  $2^x + 2^{2x} + 2^{3x}$ ?

5

$$(3^x + 3^x + 3^x) \cdot 3^x$$

Which of the following is equivalent to the expression shown above?

- A)  $3^{4x}$
- B)  $3^{3x^2}$
- C)  $3^{1+3x}$
- D)  $3^{1+2x}$

6

$$\frac{(6xy^2)(2xy)^2}{8x^2y^2}$$

If the expression above is written in the form  $ax^my^n$ , what is the value of  $m+n$ ?

7

If  $x$  is not equal to zero, what is the value of  $\frac{(2x)^3(3x)}{(6x^2)^2}$ ?

8

If  $8,200 \times 300,000$  is equal to  $2.46 \times 10^n$ , what is the value of  $n$ ?

9

If  $\frac{240}{80,000} \times \frac{6,000}{900,000}$  is equal to  $\frac{1}{5 \times 10^n}$ , what is the value of  $n$ ?

## Topic: Adding, Subtracting, Multiplying, and Dividing Polynomials

1

$$a(2-a) + (a^2+3) - (2a+1)$$

Which of the following is equivalent to the expression shown above?

- A) 2
- B)  $4a$
- C)  $2a+2$
- D)  $2a-2$

2

$$(-m^2n - n^2 + 3mn^2) - (m^2n - n^2 + mn^2)$$

Which of the following is equivalent to the expression shown above?

- A)  $4mn^2$
- B)  $4m^2n$
- C)  $-2m^2n + 2mn^2$
- D)  $2m^2n + 2mn^2$

3

$$(2x^2 - 3x + 1) - (-2x^2 - 3x + 2)$$

If the expression above is written in the form  $ax^2 + bx + c$ , in which  $a$ ,  $b$ , and  $c$  are constants, what is the value of  $a + b + c$ ?

- A) 2
- B) 3
- C) 4
- D) 5

4

$$(x^3 - x^2 + 3x - 3) \div (x - 1)$$

Which of the following is the quotient of the expression shown above?

- A)  $x^2 - 3$
- B)  $x^2 + 3$
- C)  $x^2 - 2x$
- D)  $x^2 - 2x + 3$

5

$$(14x^2 + 9x - 20) \div (ax - 1) = 7x + 8 + \frac{-12}{ax - 1}$$

In the equation above,  $a$  is a constant and  $ax - 1 \neq 0$ . What is the value of  $a$ ?

6

If  $\frac{6x^2 - 5x + 4}{-3x + 1} = -2x + 1 + \frac{A}{-3x + 1}$ , what is the value of  $A$ ?

## Topic: FOIL Method and Special Products

1

$$(x+3)(x-5)$$

Which of the following is equivalent to the expression shown above?

- A)  $(x+1)^2 - 14$
- B)  $(x-1)^2 - 12$
- C)  $(x-1)^2 - 16$
- D)  $(x-2)^2 - 12$

2

$$(2-5x)(5x+2)$$

Which of the following is equivalent to the expression shown above?

- A)  $25x^2 - 4$
- B)  $-25x^2 + 4$
- C)  $25x^2 - 10x + 4$
- D)  $-25x^2 + 10x + 4$

3

$$4x^2 - 12xy + 9y^2$$

Which of the following is equivalent to the expression shown above?

- A)  $(2x^2 - 3y)^2$
- B)  $(2x^2 - 3y^2)^2$
- C)  $(2x - 3y^2)^2$
- D)  $(2x - 3y)^2$

4

$$(x+y)(x-y)(x^2+y^2)$$

Which of the following is equivalent to the expression shown above?

- A)  $x^4 - 2x^2y^2 + y^4$
- B)  $x^4 + 2x^2y^2 + y^4$
- C)  $x^4 + y^4$
- D)  $x^4 - y^4$

5

What is the value of  $\frac{3^{(a-b)} \cdot 3^{(a+b)}}{3^{2a+1}}$ ?

- A)  $\frac{1}{3}$
- B)  $\frac{1}{9}$
- C) 3
- D) 9

6

What is the value of  $\frac{2^{(a-1)(a+1)}}{2^{(a-2)(a+2)}}$ ?

- A)  $\frac{1}{16}$
- B)  $\frac{1}{8}$
- C) 8
- D) 16

## Topic: Prime Factorization, GCF, and LCM

1

$$42x^2y^2 + 63xy^3$$

Which of the following is equivalent to the expression shown above?

- A)  $21x^2y^2(2x + 3y)$
- B)  $21xy^2(2x + 3y)$
- C)  $21x^2y(2x + 3y)$
- D)  $21xy(2x + 3y)$

2

$$12x^2y - 18xy^2z$$

Which of the following is equivalent to the expression shown above?

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

3

$$5a^2b - 10abc + 5bc^2$$

Which of the following is equivalent to the expression shown above?

- A)  $5b(a - b)^2$
- B)  $5c(a - b)^2$
- C)  $5a(b - c)^2$
- D)  $5b(a - c)^2$

4

If  $x$  and  $y$  are positive integers and  $12^3 = 2^x \cdot 3^y$ , what is the value of  $x + y$ ?

5

If  $2 \times 5^9 - k \times 5^8 = 2 \times 5^8$ , what is the value of  $k$ ?

6

If  $12^{99} - 12^{97} = 12^{97} \times n$ , what is the value of  $n$ ?

## Topic: Factoring using the Distributive Property

1

$$1 + 2x - x(1 + 2x)$$

Which of the following is equivalent to the expression shown above?

- A)  $(1 - 2x)^2$
- B)  $(1 + 2x)(1 - x)$
- C)  $-x(1 + 2x)$
- D)  $x(1 - 2x)$

2

What is the value of  $x$ , if  $rx + sx = 3$  and  $r + s = \frac{1}{3}$ ?

- A) 1
- B) 3
- C) 9
- D) 27

3

$$2ax - 6a - 3x + 9$$

Which of the following is equivalent to the expression shown above?

- A)  $(2a - 1)(x - 9)$
- B)  $(2a - 3)(2x - 3)$
- C)  $(a - 3)(2x - 3)$
- D)  $(2a - 3)(x - 3)$

4

$$mn - 5n - m + 5$$

Which of the following is equivalent to the expression shown above?

- A)  $(m - 5)(n - 1)$
- B)  $(m - 1)(n - 5)$
- C)  $(m + 5)(n + 1)$
- D)  $(m - 5)(5n - 1)$

5

$$7y^2 - 21xy - 2y + 6x$$

Which of the following is equivalent to the expression shown above?

- A)  $(7y - 3)(y - 2x)$
- B)  $(7y - 2)(2y - 3x)$
- C)  $(7y - 2)(y - 3x)$
- D)  $(7y + 2)(2y - 3x)$

6

$$x - 2y + 3z - 2wx + 4wy - 6wz$$

Which of the following is equivalent to the expression shown above?

- A)  $(1 + 2w)(x + 2y - 3z)$
- B)  $(1 - 2w)(x - 2y + 3z)$
- C)  $(1 + 2w)(x - 2y - 3z)$
- D)  $(1 - 2w)(x - y - 3z)$

## Unit 10 Review Questions

1

$$\frac{2^{(a+b)^2}}{2^{(a-b)^2}}$$

Which of the following is equivalent to the expression shown above?

- A)  $8^{(a+b)}$
- B)  $8^{ab}$
- C)  $16^{a+b}$
- D)  $16^{ab}$

2

$$2m^2n - mnp - 6m + 3p$$

Which of the following is equivalent to the expression shown above?

- A)  $(2m - n)(mp - 3)$
- B)  $(2m - p)(mn - 3)$
- C)  $(2m + p)(mn + 3)$
- D)  $(2m - n)(mn - 3p)$

3

$$\left(\frac{a+b}{2}\right)^2 - \left(\frac{a-b}{2}\right)^2 =$$

- A)  $ab$
- B)  $-ab$
- C)  $\frac{2ab + b^2}{2}$
- D)  $ab + b^2$

4

If  $\left(x + \frac{1}{x}\right)^2 = 9$ , then  $\left(x - \frac{1}{x}\right)^2 =$

- A) 3
- B) 5
- C) 7
- D) 9

5

If  $8^{\frac{4}{3}} \cdot 8^{-\frac{8}{3}} = \frac{1}{2^m}$ , what is the value of  $m$ ?

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

6

If  $xy \neq 0$ , then  $\frac{(-2xy^2)^3}{4x^4y^5} =$

- A)  $-\frac{xy}{2}$
- B)  $-\frac{2}{x}$
- C)  $-\frac{2y}{x^2}$
- D)  $-\frac{2y}{x}$

7

If  $x^{12} = 32n^4$  and  $x^9 = 4n$ , then  $x =$

- A)  $2n$
- B)  $2n^{\frac{1}{2}}$
- C)  $4n^{\frac{1}{2}}$
- D)  $4n$

8

$$(3x^3 - 2x^2 - 7) - (-2x^2 + 6x + 2)$$

Which of the following is equivalent to the expression shown above?

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

9

$$9x - (x - 3)(x + 12)$$

Which of the following is equivalent to the expression shown above?

- A)  $36 - 18x - x^2$
- B)  $36 + 12x - x^2$
- C)  $(6 - x)(6 + x)$
- D)  $(6 - x)^2$

10

If  $\frac{(2.1 \times 10^{-3})(2 \times 10^5)}{7 \times 10^{-4}} = 6 \times 10^n$ , what is the value of  $n$ ?

11

If  $a^{\frac{3}{4}} = 8$ , what is the value of  $a^{\frac{1}{2}}$ ?

12

$$\frac{x^2 - x - a}{x - 2} = x + 1 - \frac{8}{x - 2}$$

In the equation above, what is the value of  $a$ ?