

1) Fill in the blanks in this statement:  $\frac{15}{1}$  is an element in the set of \_\_\_\_\_, but it is **not** in the set of \_\_\_\_\_.

- A. integers; real numbers
- B. natural numbers; integers
- C. integers; rational numbers
- D. natural numbers; whole numbers
- E. rational numbers; whole numbers

2) Simplify. Do not leave negative exponents in your answer.

$$\frac{2a^2b^{12}}{5a^{13}b^0}$$

- A.  $\frac{6b^6}{15a^{15}}$
- B.  $\frac{6}{5ab^2}$
- C.  $\frac{8a^3}{125b^5}$
- D.  $\frac{125b^6}{8a^{15}}$
- E.  $\frac{15b^6}{6a^{15}}$

3) Perform the necessary operations. Express your answer in scientific notation.

$$\frac{(3,800,000,000)(0.00006)}{0.00000019}$$

- A.  $1.2 \times 10^{12}$
- B.  $12 \times 10^8$
- C.  $1.2 \times 10^{12}$
- D.  $12 \times 10^{13}$
- E.  $1.2 \times 10^{11}$

4) Simplify.  $\sqrt[3]{\frac{27a^3}{b^9c^6}}$

A.  $\frac{9a}{b^6c^3}$

B.  $\frac{3a}{b^3c}$

C.  $\frac{3a}{b^3c^2}$

D.  $\frac{9a}{b^3c^2}$

E.  $\frac{3a}{b^6c^3}$

5) Perform the indicated operations and simplify.

$$4(y^2 - 2y) - \frac{1}{3}y(6y - 9)$$

A.  $2y^2 - 5y$

B.  $4y^2 - 10y + 3$

C.  $2y^2 - 11y$

D.  $y^2 - 11y$

E.  $2y^2 - 2y - 9$

6) Perform the indicated operation and simplify.

$$(3w + 2z)^2$$

A.  $9w^2 + 4z^2$

B.  $6w^2 + 4z^2$

C.  $9w^2 + 6wz + 4z^2$

D.  $9w^2 + 12wz + 4z^2$

E. None of these.

7) Factor completely.

$$4m^2 - 100$$

- A.  $4(m+10)(m-10)$
- B.  $4m(m+5)(m-5)$
- C.  $(2m-10)(2m+10)$
- D.  $2(m+5)(m-5)$
- E.  $4(m+5)(m-5)$

8) One factor of  $6x^3 + 23x^2y + 15xy^2$  is:

- A.  $3x+5y$
- B.  $6x+5y$
- C.  $x^2+3xy$
- D.  $x+5y$
- E.  $6x+3y$

9) Perform the indicated operations and simplify.

Assume that all denominators are nonzero.

$$\frac{2x}{x^2 - 16} + \frac{5}{x + 4}$$

- A.  $\frac{2x+5}{x^2-16}$
- B.  $\frac{3x-4}{x^2-16}$
- C.  $\frac{7x-20}{x^2-16}$
- D.  $\frac{7x-4}{x^2-16}$
- E.  $\frac{7x+20}{x^2-16}$

10) Simplify. Assume that all denominators are nonzero.

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

A.  $\frac{a+b}{b^2-a}$

B.  $\frac{2}{b-a}$

C.  $\frac{1}{b-a}$

D.  $\frac{b+a}{b^2+a^2}$

E. None of these.

11) Solve.

$$6x - \frac{2}{3}(2x+5) = -1$$

A.  $x = \frac{1}{2}$

B.  $x = \frac{13}{14}$

C.  $x = -\frac{13}{14}$

D.  $x = -\frac{1}{2}$

E.  $x = 2$

12) Solve.

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

A.  $x = -2$

B.  $x = \frac{1}{4}$

C.  $x = \frac{5}{4}$

D.  $x = 0$

E. No solution.

13) A telemarketer earns \$58/day plus \$14.50 for each insurance policy sold. If he earned \$145 for one day of work, how many policies did he sell? Set up the equation necessary to solve this problem. Do NOT solve. Assume that  $x$  represents the number of policies sold.

A.  $58x + 14.50 = 145$

B.  $14.50x = 87$

C.  $14.50x - 58 = 145$

D.  $58 = 14.50x$

E.  $58x = 130.50$

14) Omega Sports Center charges \$12 for a one-day pass for the climbing wall or \$5 for a quick-climb pass. If 42 people came to the wall on Saturday and the revenue was \$301, how many people bought a quick-climb pass?

A. 13

B. 18

C. 37

D. 21

E. None of these.