

1)  $\sqrt{12}(\sqrt{50} - \sqrt{18}) =$

A)  $4\sqrt{6}$

B)  $2\sqrt{3}$

C)  $3\sqrt{2}$

D)  $9\sqrt{6}$

E)  $2\sqrt{6}$

2) The coefficient of  $xy^2$  in the expansion of the expression  $x(2x - y)(y + 2x) - (x + y^2)^2$  is:

A) - 3

B) 1

C) - 2

D) - 4

E) 2

$$3) \frac{3(x^2 + 3)^{-1/3} - 2x^2(x^2 + 3)^{-4/3}}{(x^2 + 3)^{-4/3}} =$$

A)  $x^2 + 9$

B)  $3(1 + x)^{4/3}$

C)  $\frac{3}{(1 + x)^{4/3}}$

D)  $(2x + 3)(1 + x)^{4/3}$

E)  $\frac{2x + 3}{(1 + x)^{4/3}}$

$$4) \frac{1}{x} + \frac{2}{x - 1} - \frac{3x + 1}{x^2 - 1} =$$

A)  $\frac{1}{x(x + 1)}$

B)  $\frac{-2}{x^2 - 1}$

C)  $\frac{1}{x^2 - 1}$

D)  $\frac{1}{x - 1}$

E)  $\frac{1}{x + 1}$

5)  $3\frac{1}{7} - (-2^4)\left(\frac{3}{8} - \frac{5}{12}\right) \div \frac{1}{3} - 3\frac{1}{7} =$

A) - 2

B) 2

C)  $\frac{1}{2}$

D)  $\frac{1}{4}$

E)  $-\frac{1}{2}$

6) If  $x \geq 0$  and  $y \geq 0$ , then  $\left(\frac{x^{1/2}y^2}{2y^{1/4}}\right)^4 \cdot \left(\frac{4x^{-2}y^{-4}}{y^2}\right)^{1/2} =$

A)  $\frac{xy^4}{8}$

B)  $\frac{x^2y^3}{8}$

C)  $\frac{x^2y^4}{8}$

D)  $\frac{yx^4}{8}$

E)  $\frac{xy^2}{8}$

7) If  $(2x - 1)^3 + 8 = (2x + 1)(mx^2 + nx + p)$ , then  $m + n + p$

A) 3

B) 7

C) 4

D) 1

E) 6

8) If  $x < 0$ , then  $|x - 1| + |-x| + 3 =$

A)  $4 - 2x$

B)  $2x + 2$

C) 2

D)  $2x + 4$

E)  $2x$

9)  $y - \frac{\frac{y}{x} - \frac{x}{y}}{\frac{1}{y} - \frac{1}{x}} =$

A)  $2y + x$

B)  $x - y$

C)  $x$

D)  $\frac{1}{y}$

E)  $y$

10) If  $\frac{(12800)(2 \times 10^6)}{0.0064} = m \times 10^n$ , then  $m + n =$

A) 16

B) 13

C) 15

D) 14

E) 12

11)  $\left(1 + \frac{x}{y}\right)^2 - \left(1 - \frac{x}{y}\right)^2 = ?$

A)  $\frac{4x}{y}$

B)  $\frac{2x}{y}$

C)  $-\frac{4x}{y}$

D)  $\frac{x}{y}$

E)  $-\frac{x}{y}$

12)  $x - \frac{x^2 - 4}{x^2 + 2x + 4} \div \frac{x^2 - 2x}{x^3 - 8} =$

A)  $\frac{4}{x}$

B)  $\frac{x}{4}$

C)  $\frac{4}{x - 2}$

D)  $\frac{x - 2}{8}$

E)  $\frac{4}{x + 2}$

13) If  $A = \{ x \mid x \text{ is a whole number, } -3 < x \leq 2 \}$ ,  $B = \{ -2, -1, 0, 1 \}$ , and  $C = \{ x \mid x \text{ is a natural number less than 5} \}$ , then  $(A \cup B) \cap C =$

- A)  $\{ 1, 2 \}$
- B)  $\{ 0, 1, 2, 4 \}$
- C)  $\{ 0, 1, 2, 3 \}$
- D)  $\{ 0, 1, 2 \}$
- E)  $\{ -2, -1, 0, 1, 2 \}$

14)  $\sqrt[3]{\frac{16(x^5y^7z)^2}{x^2yz^{-6}}} =$

- A)  $2x^2y^4z^2 \sqrt[3]{2x^2yz^2}$
- B)  $2x^3y^2z^4 \sqrt[3]{x^2yz^2}$
- C)  $4x^2y^4z^2 \sqrt[3]{2x^2yz^2}$
- D)  $2x^2y^2z^3 \sqrt[3]{x^2yz^2}$
- E)  $x^2y^3z^4 \sqrt[3]{x^2yz^2}$

15)  $\left(\frac{-8}{27}\right)^{-2/3} - 2^{1/6} (-32^{1/6}) - 3(-3)^0 =$

A)  $\frac{5}{4}$

B)  $\frac{3}{2}$

C)  $\frac{7}{2}$

D) 2

E)  $\frac{29}{4}$

16) If  $\sqrt[5]{x^4} \cdot \sqrt[10]{x} = \sqrt[m]{x^n}$ , then  $m + n =$

A) 19

B) 17

C) 15

D) 16

E) 18



17) Which ONE of the following statements is TRUE?

A)  $4.\overline{13275}$  is a rational number.

B) If  $x$  is any real number, then  $\sqrt{(-x)^2} = x$ .

C)  $\pi = \frac{22}{7}$

D)  $-(3a - 5b)\frac{2}{15} = -\frac{2}{5}a - \frac{2}{3}b$

E) The sum of two irrational numbers is always an irrational number.

18) If  $x = A$  is the solution of the equation  $\frac{2x}{3} + \frac{1}{2}(x - 3) = \frac{x + 1}{4}$ , then

$11A + 2 =$

A) 23

B) 27

C) 25

D) 24

E) 26

19) If  $x > 0$  and  $y > 0$ , then  $xy\sqrt{(-2)^2\sqrt{x^2y^5}} + \sqrt[4]{(-2)^4x^6y^9} =$

A)  $4xy^2\sqrt[4]{x^2y}$

B)  $4x^2y\sqrt[4]{xy^2}$

C)  $2x^2y\sqrt[4]{xy^2}$

D)  $-xy\sqrt[4]{xy^2}$

E)  $2xy^2\sqrt[4]{x^2y^3}$

20) The expression  $\frac{\pi - 2}{|\sqrt{2} - \sqrt{\pi}|} - \sqrt{2}$  simplifies to

A)  $\sqrt{\pi}$

B)  $\pi - 2$

C)  $\sqrt{\pi} - 2$

D)  $\sqrt{2}$

E)  $2 - \sqrt{\pi}$