1) Which **one** of the following statements is **TRUE** ?

   A) $\dfrac{\sqrt{8}}{\sqrt{2}}$ is a rational number.

   B) $(ab)c = (ba)c$ represents the associative property.

   C) Every integer number has a multiplicative inverse.

   D) $\dfrac{\pi}{3.14}$ is a rational number.

   E) $3.141\overline{44}$ is an irrational number.

2) Let $a>0$ and $b<0$, then which **one** of the following statements is **TRUE** ?

   A) $\dfrac{-a}{b} > 0$

   B) $ab^2 < 0$

   C) $-b < 0$

   D) $-a+b > 0$

   E) $|b| = b$

3) Let x and y be any two real numbers, then which **one** of the following

    statements is **FALSE** ?

    A) $\left|-x\right| = x$

    B) $(x-y)^2 = (y-x)^2$

    C) $\left|x-y\right| = \left|y-x\right|$

    D) $\left|x\right|^2 = \left|x^2\right| = x^2$

    E) $x-y = -(y-x)$

4) If $S = (-\infty, -2) \cup (2, \infty)$ and $T = [-1, 3]$, then $S \cap T =$

    A) $(2, 3]$

    B) $(-2, -1]$

    C) $[-1, 3]$

    D) $(-2, 2)$

    E) $(-2, 3)$

5) $\dfrac{\left(3^{-1}a^{-2}\right)^{-1}\left(3a^{4}\right)^{-2}}{\left(3^{-2}a^{-3}\right)^{2}} =$

A)   27

B)   3

C)   1

D) $3a^{-1}$

E) $3a$

6) $(1.1)^{2} - 2\,(1.1)\,(0.9) + (0.9)^{2} =$

A) 4×10^{-2}

B) 2×10^{-4}

C) 4×10^{-1}

D) 2×10^{-2}

E) 2×10^{-1}

7) If $a = 6.9 \times 1.5 \times 10^{-3}$ and $b = 0.023$, then $\dfrac{a}{b} =$

   A)   0.45

   B)   4.5

   C)   0.045

   D)   0.0045

   E)   45

8) If $A = \left(\dfrac{1000}{8}\right)^{\frac{2}{3}}$ and $B = \sqrt{0.49} \div 0.7 + \left(\dfrac{-1}{\sqrt{2}}\right)^{0}$, then $AB =$

   A)   50

   B)   25

   C)   10

   D)   5

   E)   75

9) If the radical expression $\dfrac{1}{\sqrt[3]{16x^5}}$ simplifies to $\dfrac{\sqrt[3]{ax}}{bx^c}$, then $a + b + c =$

A)   10

B)   12

C)   4

D)   6

E)   8

10) If $x > 1$, then $\sqrt[5]{(-x)^5} + \sqrt[6]{(\sqrt{x} - x)^6} =$

A) $-\sqrt{x}$

B) $-2x$

C) $2x$

D) $\sqrt{x}$

E)   0

11) If $x > 0$ and $y > 0$, then $\dfrac{3x\sqrt{16x^2y^3}}{4y\sqrt{64x^4y}} =$

A) $\dfrac{3}{8}$

B) $\dfrac{1}{4}$

C) $3\sqrt{y}$

D) $\dfrac{3x}{y}$

E) $\dfrac{3y}{4x}$

12) When simplified, the expression $(1 + 2x)^2 + (1 + 2x)(1 - 2x)$ is

A) a binomial of degree 1.

B) a binomial of degree 2.

C) a monomial of degree 1.

D) not a polynomial.

E) a trinomial of degree 2.

13) The **coefficient** of $x^2 y$ in the expression $(x - 3y)^3 - 2y(x^2 + y)$, is

    A) -11

    B) -9

    C) 27

    D) 2

    E) -7

14) One factor of $2x^3(x + 3)^{-\frac{1}{2}} - 8x(x + 3)^{\frac{1}{2}}$ is

    A) $x - 6$

    B) $x + 6$

    C) $x - 3$

    D) $x - 2$

    E) $x + 1$

15) For any positive integer $n,$ one of the factors of $2x^{4n} - 32$ is

 A) $x^{2n} + 4$

 B) $x^n + \sqrt{2}$

 C) $x^n - 4$

 D) $x^{2n} - 8$

 E) $x^n - \sqrt{2}$

16) One factor of $4a^2 - c^2 - b^2 + 2bc$ is

 A) $2a - b + c$

 B) $2a - b - c$

 C) $2a + b + c$

 D) $2a - b$

 E) $2b - c$

17)   The expression $\dfrac{(x+1)^3 - 3x(x+1)}{x^3+1}$ simplifies to

    A)   1

    B) $\dfrac{x-1}{x+1}$

    C) $\dfrac{x+1}{x-1}$

    D)   0

    E) -1

18)   If $\left(x+1-\dfrac{6}{x}\right) \div \left(\dfrac{x^2-2x-15}{x}\right) = \dfrac{x-m}{x-n}$, then $m+n=$

    A)   7

    B)   9

    C)   8

    D)   6

    E)   5

19) If $a \neq 0$ and $b \neq 0$, then $\dfrac{a}{ab^{-1} + a^{-1}b} =$

A) $\dfrac{a^2 b}{a^2 + b^2}$

B) $\dfrac{ab}{a + b}$

C) $\dfrac{a}{a^2 + b^2}$

D) $\dfrac{1}{b}$

E) $\dfrac{ab^2}{a + b}$

20) $\dfrac{1}{x - 2} + \dfrac{x^2 - 2x + 4}{x^3 - 4x} \div \dfrac{x^3 + 8}{x^2 + 4x + 4} =$

A) $\dfrac{x + 1}{x(x - 2)}$

B) $\dfrac{x - 1}{x(x + 2)}$

C) 1

D) $\dfrac{1}{x(x - 2)}$

E) $\dfrac{x}{x + 2}$

1) A
2) A
3) A
4) A
5) A
6) A
7) A
8) A
9) A
10) A
11) A
12) A
13) A
14) A
15) A
16) A
17) A
18) A
19) A
20) A