1) $\dfrac{-\ 20 \div 4 \times 5 \div 5\ -\ 3}{-\ 4\ -\ (1\ -\ 3)\ -\ 2 \times 6 \div 2} =$

    A)   1

    B)   - 1

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

    D) $\dfrac{1}{8}$

    E) $\dfrac{2}{3}$

2) If $x - 2 = y$, then $\dfrac{2\,|x - y| + |y - x|}{x - y} =$

    A)   3

    B)   0

    C)   - 3

    D)   1

    E)   - 1

3) The number of rational numbers in the set

$$A = \left\{ 0,\ -4\ ,\ 3.14\ ,\ \sqrt{3}\ ,\ -2.17\overline{359}\ ,\ \frac{\pi}{3.14}\ ,\ \sqrt{64}\ ,\ \sqrt[3]{-8}\ ,\ \frac{12}{6}\ ,\ \frac{-7}{\sqrt{4}} \right\} \quad \text{is}$$

A)   8

B)   7

C)   6

D)   5

E)   9

4) Which one of the following statements is FALSE ?

A) $\sqrt{x^2 - 2xy + y^2} = x - y$, for any real numbers x and y.

B) $(y - x)^2 = (x - y)^2$, for any real numbers x and y.

C) $\dfrac{22}{7}$ is a rational number.

D)   The multiplicative inverse of $\dfrac{1}{\sqrt{3}}$ is $\sqrt{3}$.

E) $\sqrt{3}\, x^2 + x + \dfrac{1}{2}$ is a polynomial of degree 2 .

5) If $x \geq 3$, then $\sqrt{9 - 6x + x^2} + \sqrt[3]{-8\,y^3} + \sqrt[4]{(-2)^4 x^4}$ =

   A) $3x - 2y - 3$

   B) $x - 2y + 3$

   C) $3x + 2y - 3$

   D) $-x - 2y - 3$

   E) $x - 2y - 3$

6) If $x , y > 0$, then $\sqrt[4]{\dfrac{x^{-4}}{81\,y^8}}\left(\dfrac{\sqrt{3}\,x^{-2}}{(\sqrt{y})^{-1}}\right)^2$ =

   A) $\dfrac{1}{x^5 y}$

   B) $\dfrac{\sqrt{y}}{x^2}$

   C) $\dfrac{1}{xy^5}$

   D) $x^5 y$

   E) $\dfrac{x^5}{y}$

7) If $x > 0$, then the expression $\dfrac{\sqrt[3]{x^2}\,\sqrt{\sqrt{x}}}{\sqrt[4]{x^3}}$, simplifies to

A) $\sqrt[6]{x}$

B) $\sqrt[4]{x}$

C) $\sqrt[3]{x}$

D) $\sqrt[8]{x}$

E) $\sqrt[9]{x}$

8) If $A = \sqrt{32} - \sqrt{18}$, $B = \sqrt[3]{54} + \sqrt[3]{-16}$, and $C = \sqrt[12]{(-5)^{12}} + \sqrt[9]{(-3)^9}$
then $(AB)^{3C} =$

A)   32

B)   28

C)   - 30

D)   30

E)   36

9) The expression $\left(2\sqrt{x} + y\right)\left(2\sqrt{x} - y\right) + \left(2 - y\right)^2$ simplifies to

A) $4x - 4y + 4$

B) $4x^2 - 4y + 4$

C) $4x - 4y - 4$

D) $2y^2 + 4x - 4y + 4$

E) $4x + 4y + 4$

10) The sum of all the coefficients of the polynomial $\left(x^2 - 2\right)^3 - \left(x^6 + 8\right)$ is

A) -10

B) -6

C) 22

D) 6

E) 2

11) If $x^2 + \dfrac{1}{x^2} = 3$, then $\left(x - \dfrac{1}{x}\right)^2 =$

A) 1

B) - 1

C) - 4

D) 4

E) 9

12) One of the factors of $3y^3 + 15y^2 - 12y - 60$ is

A) $y + 2$

B) $y^2 - 2$

C) $y^2 + 4$

D) $y - 5$

E) $y - 4$

13) If $4x^2 + 36x + C = (ax + b)^2$, then $a + b =$

    A)   11

    B)   7

    C)   9

    D)   - 7

    E)   - 9

14) One of the factors of $(2x - 1)^3 - 1$ is

    A) $4x^2 - 2x + 1$

    B) $2x$

    C) $2x - 1$

    D) $x - 2$

    E) $4x^2 + 2x + 1$

15) The expression $\dfrac{2}{2 - \sqrt{8}}$ simplifies to

     A) $-1 - \sqrt{2}$

     B) $1 - \sqrt{2}$

     C) $-1 + \sqrt{2}$

     D) $-2 + \sqrt{2}$

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

16) $\dfrac{2y}{5-y} + \dfrac{10}{y-4} \div \dfrac{y^2 - 25}{y^2 + y - 20} =$

     A) -2

     B) 2

     C) $\dfrac{2y}{(y-5)(y+5)(y-4)}$

     D) $\dfrac{2y+10}{y-5}$

     E) $\dfrac{y+5}{(y-5)(y-4)}$

17) The equation $\dfrac{7x - 12}{x^2 - 3x} - \dfrac{2}{x} = \dfrac{3}{x - 3}$ has

    A) no real solution.

    B) one positive odd integer solution only.

    C) one negative odd integer solution only.

    D) one positive even integer solution only.

    E) one negative even integer solution only.

18) The sum of all the real solutions of the equation $2(y - 4)^{\frac{2}{3}} = 8$ is

    A)   8

    B)   12

    C)   16

    D)   0

    E)   - 4

19) The expression $\dfrac{(0.00002)(6.9 \times 10^8)}{23}$ in scientific notation, is equal to

A)　6×10^2

B)　6×10

C)　3×10^2

D)　2×10^2

E)　6×10^{-2}

20) The expression $\dfrac{\dfrac{1-t}{1+t} - \dfrac{1+t}{1-t}}{\dfrac{1}{1+t} - \dfrac{1}{1-t}}$ simplifies to

A)　2

B)　- 2

C)　- 1

D)　1

E)　0