1)   If $\dfrac{0.7 \times 10^{-5}}{(-1.4 \times 10^{-6})\,(-1000)} = A \times 10^{B}$ is written in scientific notation, then $A + B =$

A)   2

B)   $-3$

C)   $-2$

D)   1

E)   3

2)   $\dfrac{9 + 2^{2} \times (-1)^{5}}{(6 - 2)^{2} \div 8 + 3} =$

A)   $\dfrac{134}{80}$

B)   $-\dfrac{134}{80}$

C)   1

D)   2

E)   $-1$

3) The expression $\dfrac{y^2 - 1}{\sqrt{y} + 1}$ simplifies to

A) $(y - 1)(\sqrt{y} - 1)$

B) $y(\sqrt{y} - 1)$

C) $(y + 1)(\sqrt{y} + 1)$

D) $(y + 1)(\sqrt{y} - 1)$

E) $(y - 1)(\sqrt{y} + 1)$

4) If the difference between the squares of two consecutive natural numbers is 27 and $x$ is the smallest number, then $2x - 1$ is equal to

A) 24

B) 28

C) 25

D) 27

E) 26

5)   If $\left( \dfrac{3}{2-x} + \dfrac{x-1}{x^2-x-2} \right) \div \dfrac{x^2-4}{3x+3} = \dfrac{A}{(x-B)^2}$ , then $A + B =$

A)   - 4

B)   - 7

C)   - 8

D)   8

E)   4

6)   The number of integers in the set

$B = \{5, \sqrt{7}, -13, 0, \dfrac{0}{9}, \sqrt{4}, 0.7, -7\pi, 0.\overline{4}\}$

A)   3

B)   4

C)   7

D)   6

E)   5

7) If $A(a, 0)$ is the $x$-intercept and $B(0, b)$ is the $y$-intercept of the graph of $y = \sqrt{x + 4}$ , then $a + b =$

A) $- 2$

B) $0$

C) $2$

D) $- 1$

E) $1$

8) Given the intervals $A = (-1, 5)$ , $B = (1, 7]$ and $C = [2, 6]$ , then $(A \cap B) \cup C =$

A) $(1, 5]$

B) $(-1, 7]$

C) $(1, 6]$

D) $[1, 5)$

E) $[1, 6]$

9) One factor of   $54 + 2(2x+1)^3$   is

A)  $(x+2)$

B)  $(5x+1)$

C)  $(x+1)$

D)  $(2x+1)$

E)  $(2x+3)$

10) Let $x>0$, $y>0$. Then   $x\sqrt{27x^3y^5} - 4y^2\sqrt{3x^5y} =$

A)  $5x^2y^2\sqrt{3xy}$

B)  $-x^2y^2\sqrt{3xy}$

C)  $5x^4y^4\sqrt{3xy}$

D)  $x^2y^2\sqrt{3xy}$

E)  $-x^4y^4\sqrt{3xy}$

11) For the circle, $3x^2 + 3y^2 + 18x + 24y + 27 = 0$ , which one of the following is TRUE?

    A)   The center is (3 , 4) and the radius is 2 .

    B)   The center is (4 , 3) and the radius is 4 .

    C)   The center is (- 3 , - 4) and the radius is 4 .

    D)   The center is (- 4 , - 3) and the radius is 4 .

    E)   The center is (3 , 4) and the radius is 4 .

12) $\dfrac{ab^{-1} - ba^{-1}}{a^{-1} - b^{-1}} =$

    A)   $\dfrac{1}{a - b}$

    B)   $a + b$

    C)   $a - b$

    D)   $- a - b$

    E)   $b - a$

13) If the point $(1, y)$ is 5 units from the point $(5, 2)$, then one value of $y$ is

A)  4

B)  - 1

C)  0

D)  1

E)  - 4

14) If $\dfrac{a}{(2a + 5)} = (3b - 1)$, then $a =$

A) $\dfrac{5 + 15b}{6b + 3}$

B) $\dfrac{5 - 15b}{6b + 3}$

C) $\dfrac{5 + 15b}{6b - 3}$

D) $\dfrac{15b - 5}{6b - 3}$

E) $\dfrac{5 - 15b}{6b - 3}$

15) The sum of all the real solutions of the equation $3(x-2)^{\frac{4}{3}} = 48$ is

A)    2

B)    - 4

C)    0

D)    4

E)    - 2

16) The coefficient of $x$ in the expression $x(2x-1)(2x+1) - (x-2)^3$ is

A)    -11

B)    - 13

C)    13

D)    - 7

E)    11

17)   If $\dfrac{8(x^n)^{-1}(x^{-1}y^3)^2}{(2x)^2(x\,y^2)^{-1}} = \dfrac{2y^m}{x^2}$ , then $m + n =$

A)   - 3

B)   0

C)   - 7

D)   7

E)   3

18)   One factor of   $y^{\frac{1}{4}} + y^{-\frac{3}{4}} - 2y^{-\frac{7}{4}}$   is

A)   $(y - 2)$

B)   $(y - 3)$

C)   $(y + 3)$

D)   $(y - 1)$

E)   $(y + 1)$

19) If $x^2 - 2xy - 3y^2 = 4$ and $x^2 - y^2 = 6$, then $\dfrac{x - 3y}{x - y} =$

A) $\dfrac{1}{6}$

B) $6$

C) $24$

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

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

20) The graph of the equation $\dfrac{x^3}{|y|} = x^5 - 2y$ is

A) symmetric about the $x$-axis, the $y$-axis and the origin.

B) symmetric about the $y$-axis only.

C) not symmetric about the $x$-axis, the $y$-axis nor the origin.

D) symmetric about the origin only.

E) symmetric about the $x$-axis only.

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