

- 1) Let $A = \{ x \mid x \text{ is a even integer, } -1 \leq x < 4 \}$
 $B = \{ x \mid x \text{ is a negative integer greater than } -5 \}$ and $C = \{-5, 2, 4\}$
Then $(A \cup B) \cap C =$

- A) $\{2\}$
- B) $\{-5, 1, 2\}$
- C) $\{-5, 2\}$
- D) $\{4, 2\}$
- E) $\{4\}$

- 2) The number of rational numbers in the set
 $\left\{ \frac{7\pi}{22}, (1 - \sqrt{3})^0, 3.14, \sqrt[5]{-32}, \sqrt{8}, \frac{0}{\pi}, \frac{\sqrt{3}}{\sqrt{27}}, 1.2334\bar{2} \right\}$

- A) 6
- B) 5
- C) 3
- D) 4
- E) 2

3) If $\left(\frac{x^2 y^{-\frac{1}{3}}}{x^{\frac{n}{3}} y^{\frac{1}{3}}} \right)^3 = \frac{x}{y^2}$, then $n =$

A) 5

B) 3

C) - 4

D) - 3

E) 4

4) $(\sqrt[3]{3} - 2)(\sqrt[3]{9} + 2\sqrt[3]{3} + 4) =$

A) - 5

B) 11

C) 5

D) 2

E) 4

5) Let $x > 0$ and $y > 0$. If $3xy \sqrt[4]{32xy^6} - 4 \sqrt[4]{2x^5y^{10}} = 2xy^m \sqrt[4]{2xy^n}$, then $m + n =$

A) 4

B) 3

C) 2

D) 1

E) 5

6) $9 \left(-\frac{27}{64} \right)^{-\frac{2}{3}} - \frac{6}{5} \div \frac{1}{5} =$

A) 10

B) - 22

C) 22

D) 74

E) - 74

7) If $-3 < x < -1$, then $\left| \frac{|-2x| - 2|x - 2|}{4x + 4} \right|$

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

B) $\frac{2}{x+1}$

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

D) -1

E) 1

8) Let $A = 0.0000021$, $B = 200000$, and $C = 8.4 \times 10^{-n}$. If $\frac{AB}{C} = 5 \times 10^3$,
then $n =$

A) 5

B) 4

C) -6

D) -4

E) 6

9) If $x < y$, then $\frac{x - y}{\sqrt{x^2 - 2xy + y^2}} =$

A) - 1

B) xy

C) $y - x$

D) 1

E) $x - y$

10) The coefficient of x^4 in the expression $(2 - x^2)^3 - (2 + x^2)(2 - x^2)$, is

A) 7

B) - 12

C) - 1

D) 4

E) 12

11) One factor of $y^3 - x^2y + x^2 - y^2$, is

A) $y + x$

B) $x - y + 1$

C) $x - y - 1$

D) $xy - 1$

E) $x + y + 1$

12)
$$\frac{(1+x^2)^{\frac{1}{2}} - x^2(1+x^2)^{-\frac{1}{2}}}{(1+x^2)^{-\frac{3}{2}}} =$$

A) $1 + x^2$

B) $2 + x^2$

C) $x^2 - 1$

D) $1 - x^2$

E) 1

13) $\left(\frac{xy^{-2} - x^{-2}y}{x^{-3} - y^{-3}} \right)^{-2} =$

A) $\frac{1}{x^2y^2}$

B) $-\frac{1}{xy}$

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

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

E) $-xy$

14) If $\frac{x^2 + 8x + 16}{x^2 + 2x - 3} \div \frac{x + 4}{x - 1} = \frac{x + a}{x + b}$, then $a + b =$

A) 7

B) 2

C) -2

D) 3

E) -3

15) Let M be the midpoint of the line segment $A(-2, 1)$ and $B(-8, -3)$. The distance between the point M and $(-2, 3)$ is given by

A) 5

B) 3

C) 4

D) 2

E) 6

16) If $x^2 + y^2 + 2x + dy + 1 = 0$ is the equation of the circle that has center $(-1, a)$ in the second quadrant and tangent to both axes, then $a + d =$

A) -1

B) 2

C) 4

D) 1

E) -2

17) The product of the x -intercepts of the graph of the equation

$$(x - 1)^2 + y^2 = 2 \text{ is}$$

- A) - 1
- B) 2
- C) - 2
- D) - 3
- E) 1

18) The solution set of the equation $4x^{\frac{3}{4}} + 32 = 0$ contains

- A) no real solution.
- B) a positive integer.
- C) a negative integer.
- D) a positive irrational number.
- E) one positive and one negative integer.

19) Which one of the following is NOT a polynomial ?

A) $x^2 + |x| + 1$

B) $\frac{1}{2}x^2 + 3x$

C) $\sqrt{7}$

D) πx

E) $\frac{2x - 3}{5}$

20) Which one of the following is TRUE ?

A) $|-x| = -x ; x < 0$

B) $(x + y)^3 = x^3 + y^3$

C) The sum of two irrational numbers is an irrational number

D) $\sqrt{a^2} = a$

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

Answer Key

Testname: MAJOR #1 TERM 221CODE 000

- 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