

1) If  $f(x) = 3 - (x + 2)^2$ ,  $x \geq -2$ , then

A)  $f^{-1}(x) = -2 + \sqrt{3 - x}$

B)  $f^{-1}(x) = 1 + \sqrt{x + 3}$

C)  $f^{-1}(x) = 1 - \sqrt{x - 3}$

D)  $f^{-1}(x) = 2 + \sqrt{3 - x}$

E)  $f^{-1}(x) = -2 - \sqrt{3 - x}$

2) If  $f(x) = 1 + e^{x-1}$ , then the domain of  $f^{-1}$  is

A)  $(1, \infty)$

B)  $[1, \infty)$

C)  $[0, \infty)$

D)  $(-\infty, 1) \cup (1, \infty)$

E)  $(-\infty, 1)$

3) The SUM of all solutions of the equation  $125^{-3} = \left(\frac{1}{5}\right)^{|x+2|}$  is

A) - 4

B) 1

C) 5

D) - 5

E) 4

4) Which one of the following statements is TRUE about the function

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

A) The range of  $f$  is  $(-1, \infty)$ .

B) The  $x$ -intercept of  $f$  is  $-1$ .

C)  $f$  is decreasing on  $(-\infty, \infty)$ .

D) The domain of  $f$  is  $(-\infty, 1)$ .

E) The  $y$ -intercept of  $f$  is  $-1$ .

5) The graph of the function  $y = \left| \log_2 (x + 2) \right|$ , is increasing on

- A)  $(-1, \infty)$
- B)  $(-\infty, -1)$
- C)  $(-2, -1)$
- D)  $(-\infty, -2)$
- E)  $(-\infty, -2) \cup (-1, \infty)$

6) If  $x > 0$ , then the expression  $\frac{1}{2} \ln e^2 + \frac{1}{3} \log (10^6 x^3) - \log (0.1 x) - 1$  is equal to

- A) 3
- B)  $\log x$
- C) -1
- D)  $\log 3x$
- E)  $-\log x$

7) If  $\log 0.4 = x$ , then  $\log_2 20 =$

A)  $\frac{x + 3}{x + 1}$

B)  $x + 1$

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

D)  $x - 1$

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

8)  $\log_3 108 - \log_3 4 =$

A) 3

B) 2

C) 1

D) 5

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

9) The sum of all solution(s) of the equation

$$\log_2 \sqrt[3]{x+5} + \log_8 (3x-1) = 2 \quad \text{is}$$

- A) 3
- B) 14
- C) 11
- D) 10
- E) -6

10) The sum of all solution(s) of the equation  $2^x - 10(2^{-x}) + 3 = 0$ , is

- A) 1
- B) 4
- C) 0
- D) 3
- E) 6

11) If the terminal side of the angle  $\theta$  in standard position lies in Quadrant III and is parallel to the line  $4y - 2x - 1 = 0$ , then  $\sqrt{5} \cos \theta =$

A) - 2

B) - 1

C) 3

D) - 3

E) 5

12)  $\sqrt{2} \sec (585^\circ) =$

A) - 2

B) - 5

C)  $-\frac{\sqrt{3}}{3}$

D) - 1

E)  $-\sqrt{2}$

13) The tires of a car have diameter 40 centimeters and are turning 5 times per second. How fast is the car traveling in centimeters per minute?

A)  $12000 \pi$

B)  $4000 \pi$

C)  $5000 \pi$

D)  $8400 \pi$

E)  $2000 \pi$

14) Which ONE of the following angles is coterminal with the angle  $50^\circ$ ?

A)  $-670^\circ$

B)  $777^\circ$

C)  $230^\circ$

D)  $-480^\circ$

E)  $-130^\circ$

15) If  $\sec \theta = -3$  and  $\sin \theta > 0$ , then  $\csc \theta - \cot \theta$  is equal to

A)  $\sqrt{2}$

B)  $-2\sqrt{2}$

C) 2

D)  $-10\sqrt{2}$

E)  $2\sqrt{2}$

16)  $\cot\left(-\frac{23\pi}{6}\right) =$

A)  $\sqrt{3}$

B)  $-\frac{\sqrt{3}}{3}$

C)  $\frac{\sqrt{3}}{3}$

D)  $3\sqrt{3}$

E)  $-\sqrt{3}$



17) A 20 ft ladder leans against a building so that the angle between the ground and the ladder is  $\theta$ . If  $\cot \theta = \frac{4}{3}$ , then the height at which the ladder reaches on the building is

- A) 12 ft
- B) 10 ft
- C) 5 ft
- D) 30 ft
- E) 8 ft

18) If  $\sec \theta = -2$  and  $\tan \theta > 0$ , then a possible value of  $\theta$  is

- A)  $240^\circ$
- B)  $300^\circ$
- C)  $210^\circ$
- D)  $330^\circ$
- E)  $150^\circ$

19) If  $f(x) = \frac{x \cos x}{\sin^3 x}$  and  $g(x) = -\tan(-x)$ , then

- A)  $f$  is an even function and  $g$  is an odd function
- B)  $f$  is an even function and  $g$  is an even function
- C)  $f$  is an odd function and  $g$  is an even function
- D)  $f$  is an odd function and  $g$  is an odd function
- E)  $f$  is an even function and  $g$  is neither an odd nor an even function

20) If an arc subtends a central angle of measure  $80^\circ$  in a circle with radius 4 cm, then the arc length is

- A)  $\frac{16\pi}{9}$  cm
- B)  $\frac{4\pi}{7}$  cm
- C)  $\frac{8\pi}{5}$  cm
- D)  $\frac{14\pi}{3}$  cm
- E)  $\frac{16\pi}{7}$  cm