

Sample Questions for Math Placement Test

LEVEL 2

11. If  $3 - 4y = 5x - 6$ , then  $y =$

- A.  $-\frac{5x+9}{4}$
- B.  $-\frac{5x-9}{4}$
- C.  $-\frac{5}{4}x + 9$
- D.  $-\frac{5}{4}x - 9$
- E.  $-\frac{5x-3}{4}$

12.  $(3x - 7y)^2 =$

- A.  $9x^2 + 49y^2$
- B.  $9x^2 - 21xy + 49y^2$
- C.  $9x^2 - 42xy + 49y^2$
- D.  $9x^2 - 49y^2$
- E.  $6x^2 - 14y^2$

13.  $\sqrt{8a^8} =$

- A.  $4a^2$
- B.  $4a^4$
- C.  $2\sqrt{2}a^2$
- D.  $2\sqrt{2}a^4$
- E.  $4a^8$

14.  $-3x^2y(xy^2 - 2y - 1) =$

- A.  $-3x^2y^2 + 9x^2y$
- B.  $-3x^3y^3 + 6x^2y^2 + 3x^2y$
- C.  $-3x^3y^3 + 6x^2y^2 - 1$
- D.  $-3x^3y^3 + 2y - 1$
- E.  $-3x^3y^3 - 6x^2y^2 - 3x^2y$

15.  $\frac{x^2+2x-3}{x^2-1} =$

- A.  $\frac{x-3}{x+1}$
- B.  $\frac{x+3}{x+1}$
- C.  $3 - 2x$
- D.  $\frac{x-3}{x-1}$
- E.  $\frac{x+3}{x-1}$

16. The solution to  $x^2 - x - 6 > 0$  is

- A.  $-3 < x < 2$
- B.  $x < -3$  or  $x > 2$
- C.  $-2 < x < 3$
- D.  $x < -2$  or  $x > 3$
- E.  $x > 3$

17. The perimeter of a rectangle is nine times its width. If the width is 20, the length is

- A. 25
- B. 90
- C. 70
- D. 80
- E. 45

18.  $\frac{1}{2x-y} - \frac{2}{x+2y} =$

- A.  $\frac{-1}{x-3y}$
- B.  $\frac{4y-3x}{2x^2-2y^2}$
- C.  $\frac{3y-3x}{2x^2+3xy-2y^2}$
- D.  $\frac{4y-3x}{2x^2+xy-2y^2}$
- E.  $\frac{4y-3x}{2x^2+3xy-2y^2}$

19. If  $f(x) = \frac{4x}{1-x}$  and  $g(x) = \frac{2}{x}$ , then  $f(g(x)) =$

- A.  $\frac{8}{x-2}$
- B.  $\frac{8}{1-x}$
- C. 4
- D.  $\frac{1-x}{2x}$
- E.  $\frac{8(x-2)}{x^2}$

20.  $\frac{\sqrt{a}}{1+\sqrt{a}} =$

- A.  $\frac{\sqrt{a}+a}{1+a}$
- B.  $\frac{\sqrt{a}-a}{1-a}$
- C. 1
- D.  $\frac{\sqrt{a}-a}{1-a^2}$
- E.  $\frac{a}{1+a}$

**LEVEL 3**

21. If  $g(x) = \log_3 x$ , then  $g(\frac{1}{3}) =$

- A. 1
- B.  $\frac{1}{3}$
- C.  $-3$
- D.  $-1$
- E.  $3^{1/3}$

22. If  $0 < \theta < \frac{\pi}{2}$  and  $\sin(\theta) = \frac{2}{5}$ , then  $\tan(\theta) =$

- A.  $\frac{2}{3}$
- B.  $\frac{2}{\sqrt{29}}$
- C.  $\frac{2}{\sqrt{21}}$
- D.  $\frac{2}{\sqrt{3}}$
- E.  $\frac{2}{7}$

23.  $2 \cos^2 \theta + \sin^2 \theta - 1 =$

- A.  $\cos^2 \theta$
- B.  $1 + 3 \sin^2 \theta$
- C. 1
- D.  $3 \sin^2 \theta$
- E.  $3 \cos^2 \theta$

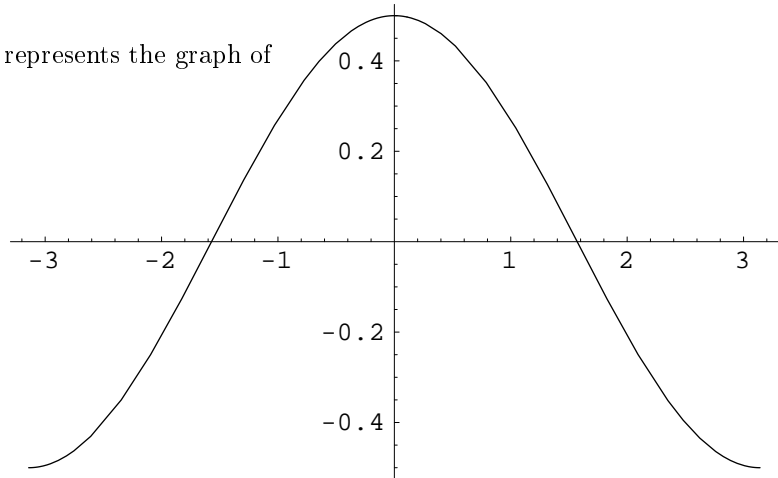
24. If  $\ln A = \frac{3}{2}$  and  $\ln B = 5$ , then  $\ln\left(\frac{A^2}{B}\right) =$

- A.  $\frac{3}{5}$
- B.  $\frac{9}{20}$
- C.  $-\frac{11}{4}$
- D.  $-2$
- E.  $e^{-2}$

25.  $\frac{3y}{27y^{n-1}} =$

- A.  $\frac{1}{9}y^n$
- B.  $-24y^{\frac{1}{n-1}}$
- C.  $9y^n$
- D.  $\frac{1}{9}y^{n-1}$
- E.  $\frac{1}{9}y^{2-n}$

26. The figure best represents the graph of



- A.  $y = \frac{1}{2} \cos(x)$
- B.  $y = \cos\left(\frac{x}{2}\right)$
- C.  $y = \cos(2x)$
- D.  $y = \frac{1}{2} \sin(x)$
- E.  $y = \sin\left(\frac{x}{2}\right)$

27. How many values of  $x$  in  $[0, 2\pi]$  satisfy  $\sin(2x) = 0$ ?

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

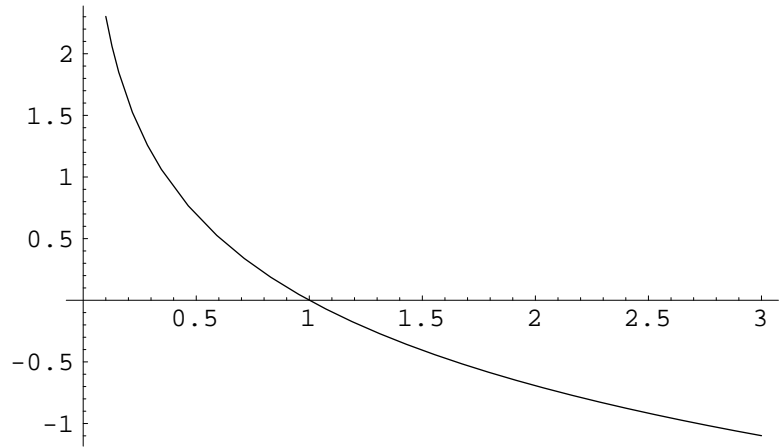
28. The solution of  $|7x - 4| \geq 3$  is

- A.  $x \geq 1$
- B.  $x \geq \frac{1}{7}$
- C.  $x \leq \frac{1}{7}$
- D.  $x \leq \frac{1}{7}$  or  $x \geq 1$
- E.  $\frac{1}{7} \leq x \leq 1$

29.  $\tan(\theta - \pi) =$

- A.  $\tan \theta$
- B.  $\cot \theta$
- C.  $\sec \theta$
- D.  $-\cot \theta$
- E.  $-\tan \theta$

30. The graph best represents



- A.  $y = \ln x$
- B.  $y = e^x$
- C.  $y = e^{-x}$
- D.  $y = -\ln x$
- E.  $y = \frac{1}{x}$