Sample Questions for Math Placement Test

LEVEL 1

1. $\frac{3}{2} - \frac{4}{5} =$

   A. $-\frac{1}{10}$
   B. $\frac{1}{3}$
   C. $\frac{7}{10}$
   D. $-\frac{1}{7}$

   E. 1

2. $12a - 7b - (4a - 21b) =$

   A. $8a + 11b$
   B. $8a - 28b$
   C. $16a + 28b$
   D. $8a + 14b$
   E. $16a + 11b$

3. Solve for x when $5(1 - x) - 2 = 3x - 4$

   A. 7/8
   B. 7/4
   C. $-1/8$
   D. 7/2
   E. $-1/2$

4. The fuel for a certain two cycle engine is a mixture of 8 parts gasoline and 2 parts oil. How many gallons of gasoline are needed to make 20 gallons of fuel?

   A. 12
   B. 14
   C. 15
   D. 16
   E. 18

5. Evaluate $x^2y - 2xy - y^2$ when $x = -3$ and $y = 4$

   A. 44
   B. -4
   C. -64
   D. -8
   E. 52

6. $(2x-3)(3x+4) =$

A. $5x^2 - x - 12$
B. $6x^2 - x - 12$
C. $6x^2 - 17x - 12$
D. $6x^2 - 12$
E. $6x^2 - 9x - 12$

7. Solve for x when $4x - 3 < 5 - x$.

A. $x > 8/5$
B. $x > 8/3$
C. $x < 2/3$
D. $x < 8/5$
E. $x < 8/3$

8. The base for a rectangular box measures 2 feet by 3 feet. What is the height in feet of the box if its volume is 54 cubic feet?

A. 6
B. 9
C. 27
D. 108
E. 324

9. If $x = -3$, then $\frac{2|x|-x}{x+1} =$

A. $\frac{3}{4}$
B. $-\frac{3}{2}$
C. $\frac{9}{2}$
D. $\frac{3}{2}$
E. $-\frac{9}{2}$

10. $(3x^3y^2)^4 =$

A. $81x^{12}y^8$
B. $81x^7y^6$
C. $12x^{12}y^8$
D. $12x^7y^6$
E. $9x^{12}y^8$

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. $3\cos^2\theta$

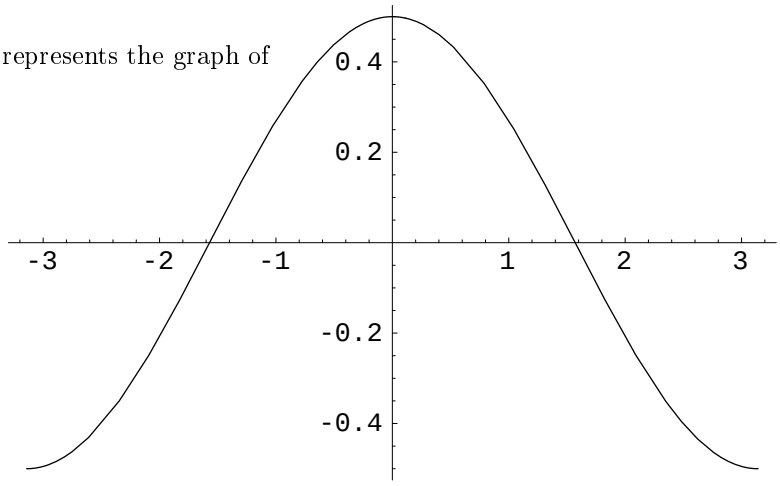
24. If $\ln A = \frac{3}{2}$ and $\ln B = 5$, then $\ln\left(\frac{A^2}{B}\right) =$

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. $y = \cos(\frac{x}{2})$
C. $y = \cos(2x)$
D. $y = \frac{1}{2}\sin(x)$
E. $y = \sin(\frac{x}{2})$

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

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

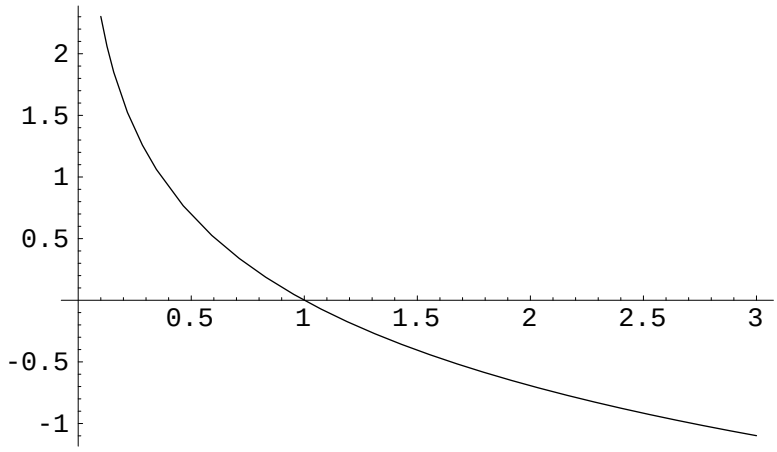
28. The solution of $|7x - 4| \geq 3$ is

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. $y = \frac{1}{x}$