



# Math Precalculus Test -Sample Questions

You have up to 90 minutes to complete 30 multiple choice questions  
Calculators and dictionaries are NOT allowed.

## Sample Questions

1.  $f(x) = 4x^2 - 7x$ . Find  $\frac{f(a+h) - f(a)}{h}$ .

- A)  $8a - 2h$       B)  $4a - 2h - 7$       C)  $8a - 4h - 7$       D)  $6a - 2h - 7$

2. Which one of the following has a graph symmetric with respect to ~~the x-axis~~ the y-axis?

- A)  $y = 2|x|$       B)  $x = 4y^2$       C)  $xy = 3$       D)  $x^2 + y^2 = 4$

3. Find  $(g \circ f)(x)$ , if  $f(x) = 9x$  and  $g(x) = x^2 - 3$ .

- A)  $3x^2 - 3$       B)  $3x^2 - 3$   
C)  $3x^2 - 3$       D)  $3x^2 - 3$

7. Find the distance between the points  $P(3, 5)$  and  $Q(1, 3)$ .

- A) 12      B) 8      C)  $4\sqrt{5}$       D)  $2\sqrt{5}$

8. Find the equation of the line containing the point  $(6, -6)$  and parallel to the line  $2y - x = 10$ .

- A)  $y = \frac{1}{2}x - 12$       B)  $y = 2x - 6$   
C)  $y = 2x - 6$       D)  $y = \frac{1}{2}x - 9$

9. Which line is perpendicular to  $x - 6y = 1$ ?

A)  $y = 3x - 4$

B)  $2x - 6y = 1$

C)  $6x - 2y = 1$

D)  $2x - 6y = 1$

10. Rationalize the denominator

- A) 2                      B) 512                      C)  $\frac{1}{2}$                       D) 2
19. Solve:  $\log_x(\log_2 8) = 2$   
 A) 3                      B)  $\frac{3}{2}$                       C)  $\sqrt{2}$                       D)  $\sqrt{3}$
20. Solve:  $\log_4(x - 6) = \log_4 x - 2$   
 A)  $\frac{2}{33}$                       B) 2                      C)  $\frac{5}{2}$                       D)  $\frac{2}{5}$
21. Solve for t:  $27^{2t-1} = 81^2$   
 A) 3                      B)  $\frac{3}{2}$                       C)  $\frac{1}{2}$                       D)  $\frac{11}{2}$
22. Solve the equation  $\sqrt{x-6} = 7 - 9$ .  
 A) 2                      B) -2                      C) -6                      D) 6
23. Solve the inequality  $|3x - 9| < 3$ .  
 A)  $\frac{6}{13}, \frac{12}{13}$                       B)                      C) ( , )                      D)  $\frac{6}{13}, \frac{12}{13}$
24. Find the inverse of the function  $f(x) = \sqrt[3]{x} - 4$ .  
 A)  $f^{-1}(x) = (x - 4)^3$                       B)  $f^{-1}(x) = \sqrt[3]{x} - 4$                       C)  $f^{-1}(x) = (x + 4)^3$                       D)

29. In which quadrant does  $\theta$  lie if  $\sin \theta < 0$  and  $\cos \theta > 0$ ?

- A) I                      B) II                      C) III                      D) IV

30. Find the period of  $y = 4 \sin \left( 8x - \frac{\pi}{2} \right)$ .

- C                      D)  $\frac{\pi}{4}$

31. Find the exact value of  $\cot(20^\circ)$ . Do not use a calculator.

- A)  $\sqrt{3}$                       B)  $\sqrt{3}/3$                       C)  $-\sqrt{3}/3$                       D)  $-\sqrt{3}$

32. Simplify  $\sin^2 \theta (\sec^2 \theta - \tan^2 \theta) + \csc^2 \theta \cot^2 \theta$ .

- A)  $\sin^2 \theta - 1 + \cos^2 \theta$     B)  $\sec^2 \theta - \cos^2 \theta$     C)  $\sin^2 \theta - 2 \sec^2 \theta$     D)  $1 - 2 \sin^2 \theta$

33. The graph of  $y = \sin x$  passes through the point  $(\frac{\pi}{4}, \frac{\sqrt{2}}{2})$ .