

**MATH PLACEMENT SAMPLE TEST
PRE-CALCULUS**

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) Which one of the following is equal to $\frac{14}{x^2-4} - \frac{5-x}{x^2+2x}$?

- (a) $\frac{14-5+x}{2x^2+2x-4}$ (b) $\frac{14+5-x}{-2x-4}$ (c) $\frac{14-5+x}{-2x-4}$ (d) $\frac{x+5}{x(x-2)}$ (e) None of these

2) Which one of the following is the solution set of $\sqrt{a-1} - 2 = 2$?

- (a) {17} (b) {1} (c) \emptyset (d) {17, 0} (e) None of these

3) The domain of $\frac{14}{x^2-4} - \frac{5-x}{x^2+2x}$ consists of:

- (a) All real numbers except 2 (b) All real numbers except ± 2 (c) All real numbers
(d) All real numbers except 0 (e) None of these

4) What is the solution set of the system $\begin{cases} 2x + y = 4 \\ 3x - y = 1 \end{cases}$?

- (a) {(0,0)} (b) \emptyset (c) {(1,2)} (d) {1,2} (e) {(2,1)}

5) What is the solution set of the equation $\frac{14}{x^2-4} = \frac{5-x}{x^2+2x}$?

- (a) {-5,-2} (b) \emptyset (c) {-5} (d) {2,-2} (e) All real numbers

6) Which one of the following is equivalent to $x^3 \leq x$?

- (a) $x \leq -1$ or $0 \leq x \leq 1$ (b) $-1 \leq x \leq 1$ (c) $x \leq 1$ (d) $x \neq \pm 1$
(e) None of these

7) For what values of x does $\frac{x^2}{x^2-1} \geq 0$?

- (a) $x \leq -1$ or $x \geq 1$ (b) $-1 \leq x \leq 1$ (c) $x < -1$ or $x > 1$
(d) $x < -1$ or $x = 0$ or $x > 1$ (e) $x = 1$ or $x = -1$

8) For what values of x does $\log_{16} 2x = \frac{1}{2}$?

- (a) 0 (b) 2 (c) 1 (d) $\frac{1}{2}$ (e) $\frac{1}{4}$

9) If $f(u) = \frac{-3u^2+2u+3}{7u^3+2u-1}$, then $f(0)$ equals

- (a) 0 (b) 3 (c) -3 (d) $\frac{1}{2}$ (e) $\frac{2}{8}$

10) What is the solution set of the equation $3^{3x} - 3^{3x-1} = 2$?

- (a) $\{0\}$ (b) \emptyset (c) $\{1\}$ (d) All real numbers (e) $\left\{\frac{1}{3}\right\}$

11) For what values of x does $\log_3(3 + \sqrt{1-x^2}) > 0$?

- (a) $-1 < x < 1$ (b) $-1 \leq x \leq 1$ (c) $x = 3$
(d) All real numbers (e) None of these

12) What is the value of y in the solution of the system $\begin{cases} x + y + z = 4 \\ 2x + 3y = 3 - z \\ 6x - 2z + 2 = 0 \end{cases}$?

- (a) $-\frac{1}{2}$ (b) 0 (c) 1 (d) $\frac{1}{2}$ (e) -1

13) Which of the following is equal to $\log a + \log b - 3 \log c$?

- (a) $\log \frac{ab}{3c}$ (b) $\log(a + b - c^3)$ (c) $\log(a + b - 3c)$
 (d) $\log \frac{ab}{c^3}$ (e) $\log(-3abc)$

14) For what values of x does $\log_{\frac{1}{2}}\left(x - \frac{1}{2}\right) = 2$?

- (a) $\frac{1}{2}$ (b) 1 (c) $\frac{1}{4}$ (d) $-\frac{1}{4}$ (e) $\frac{3}{4}$

15) For what values of x does $e^{x^2} - e^{-x} = 0$?

- (a) $\frac{1 \pm 1}{2}$ (b) $\frac{1 \pm i}{2}$ (c) $\frac{1 \pm 2}{2}$ (d) $\frac{-1 \pm 1}{2}$ (e) None of these

16) Which one of the following is the solution set of $x^2 - 3x \leq 4$?

- (a) $[-1, 4]$ (b) $(-1, 4)$ (c) $[4, -1]$ (d) $[1, 4]$ (e) $[-4, 1]$

17) Sue is two years older than John. Fifteen years ago she was twice as old as he was. How old is Sue now?

- (a) 17 (b) 18 (c) 19 (d) 20 (e) 22

18) If the circumference of a circle is multiplied by 5, how much is the area increased ?
(Recall: circumference = $2 \pi r$; area = πr^2)

- (a) 5 times (b) 10 times (c) π times (d) 25 times (e) None of these

19) What is the solution set of the system $\begin{cases} x^2 + x \leq 20 \\ 2x - 12 > 0 \end{cases}$?

- (a) $[-5, 4]$ (b) \emptyset (c) $[-5, 6)$ (d) $[4, 6)$ (e) $(6, +\infty)$

20) What is the solution set of $\log_3 x + \log_9 x \geq 3$?

- (a) $[3, +\infty)$ (b) \emptyset (c) $[9, +\infty)$ (d) $(-\infty, 3)$ (e) None of these