

**Southern Connecticut State University**  
**Mathematics Placement Test**  
**Sample Questions**

1. Evaluate  $5 + 4 \div 2 + 8 \cdot 3^2$ .
2. Find the slope between the points  $(7, -9)$  and  $(-12, 3)$ .
3. Plot the points  $(0, 4)$ ,  $(-5, 0)$ ,  $(-2, 5)$ , and  $(3, -2)$  on coordinate axes.
4. Factor the following expression completely.

$$y^2 + 14y + 45$$

5. Solve the given linear system of equations:

$$\begin{cases} 6x - 8y = -48 \\ -6x - 2y = 23 \end{cases}$$

6. Solve

$$\frac{1}{4}x + \frac{1}{3} = 3\left(\frac{2}{3}x + 4\right).$$

7. Solve the equation.

$$h^2 = 15h - 44$$

8. Solve and write the solution in interval notation.

$$4|6x + 5| + 7 > 15$$

9. Find the inverse function of  $f(x) = \sqrt{2x + 1}$ .

10. Let  $f(x) = \frac{5x^2 + 7x - 6}{5x^2 + 8x - 4}$  and  $g(x) = \frac{5x^2 + 17x - 12}{x^2 + 5x + 4}$ . Simplify  $f(x) \div g(x)$ .

11. Solve correct to 2 decimal places.

$$9^{5x-6} = 149$$

12. Starting with the graph of  $f(x) = 8^x$ , write the equation of the graph that results from shifting  $f(x)$  9 units right and then reflecting about the  $x$ -axis.

13. Solve  $\log_x(125) = 3$

14. Find the location(s) of any removable discontinuities (holes) of the function  $f(x)$ .

$$f(x) = \frac{x^2 + 11x + 24}{x^2 + 15x + 56}$$

15. The point  $(x, y)$  is on the unit circle. If  $x = -\frac{\sqrt{2}}{2}$ , and  $(x, y)$  is in quadrant II, find  $y$ . Give an exact answer.
16. Find the amplitude, period, and phase shift of  $f(x) = -4\cos\left(3x - \frac{7\pi}{4}\right)$  exactly.
17. An 18-ft ladder leans against a building so that the angle between the ground and the ladder is  $83^\circ$ . How high does the ladder reach on the building? Report your answer accurate to 2 decimal places.
18. Find a function of the form  $y = A\sin(kx) + C$  or  $y = A\cos(kx) + C$  whose graph matches the one shown below. Give your answer in exact form.

