

## Pre-requisite Skills for Pre-Calculus

The following questions reflect skills from Algebra I and Algebra II that are pre-requisite skills for Pre-Calculus. Solutions and work are posted online, as well as links to videos that solve the problems. Your pre-calculus teacher will not be re-teaching these skills in class, but extra help will be available after school. You will be assessed on these skills during the first week of the class.

**All answers should be given in fully simplified form.**

1. Determine the equation of the line:

a) through  $(-1,3)$  and  $(2,-4)$

b) through  $(-1,2)$  and perpendicular to  $2x - 3y + 5 = 0$

c) through  $(2,3)$  and the midpoint of the line segment from  $(-1,4)$  to  $(3,2)$

2. Simplify:

a)  $\frac{1}{\sqrt{2}}$

b)  $\frac{3}{5+\sqrt{7}}$

c)  $\frac{x^2+4x+4}{x-2} \cdot \frac{2-x}{3x+6}$

d)  $\frac{3}{x} - \frac{9}{x+1}$

3. Factor completely:

a)  $2x^2 - 5x - 3$

b)  $8x^3 - 18x$

c)  $x^3 - x^2 - 4x + 4$

4. Solve for x:

a)  $|5x + 6| = 16$

b)  $2x^2 + 8x = 5$

c)  $x^{\frac{2}{3}} = 16$

d)  $\frac{4-2x}{3} + \frac{1}{6} = 2x$

e)  $\frac{3}{x-1} + \frac{2}{x+1} = \frac{8}{x^2-1}$

5. Solve and graph on a number line:

a)  $|3x - 1| > 2$

b)  $|2x - 9| \leq 1$

6. Find the domain of each function:

a)  $y = \sqrt{2x - 1}$

b)  $y = \frac{3x-6}{2x+1}$

7. Find the intersection point of the lines  $3x - y = 5$  and  $2x + 3y = -4$ .

8. Solve for x:  $4^{7x-1} = 4^{2x+4}$

9.

a) Write in log form:  $5^4 = 625$

b) Write in exponential form:  $\log_3 81 = 4$

c) Evaluate:  $\log_2 32$

10. Graph and label 3 points on each graph:

a)  $y = \frac{1}{x}$

b)  $y = |x + 2|$

c)  $y = \sqrt{x} - 3$

d)  $y = (x - 1)^2$

e)  $y = -\frac{1}{2}x + 3$

f)  $2x - 3y = 6$

11. a) Given:  $f(x) = x^2 + 2x - 5$  and  $g(x) = x + 1$ , find  $f(g(x))$ .

b) Given  $f(x) = \frac{3x-5}{x+1}$ , find  $f(x + 2)$

12. Given:  $f(x) = \frac{2x-1}{x+4}$

a) find the x-intercept(s)

b) find the y-intercept

c) find any horizontal asymptotes

d) find any vertical asymptotes