

## Are You Ready For Pre-Calculus?

Show all work on separate sheet of paper. No calculator should be used!!!

1.) Find the midpoint of the following points: (a)  $(-3, 2)$  and  $(4, -1)$  (b)  $(2, -3)$  and  $(5, 2)$

2.) Find the distance between: (a)  $(-3, 2)$  and  $(4, -1)$  (b)  $(2, -3)$  and  $(5, 2)$

3.) Sketch the graph of each line: (a)  $y = -4x + 1$  (b)  $2x + 3y = 6$

4.) Solve each equation: (a)  $x^2 + 5x + 4 = 0$  (b)  $x^2 - 7x = -10$  (c)  $x^2 - 5x - 14 = 0$   
(d)  $x^2 - 15 = -2x$  (e)  $x^2 = 36$  (f)  $11x + 8 = -3x^2$   
(g)  $4x^2 - 12x = 7$  (h)  $3x^2 - 18x = 0$  (i)  $x^3 - 8 = 0$

5.) Find the slope between the two points: (a)  $(-3, 2)$  and  $(4, -1)$  (b)  $(2, -3)$  and  $(5, 2)$

6.) Find the equation of the line that passes through the following points: (a)  $(-1, 2)$  and  $(4, 7)$  (b)  $(-3, 8)$  and  $(-1, 7)$

7.) Given  $f(x) = x^2$ , state what the following transformations will do to the graph of the parent function:  
(a)  $g(x) = x^2 + 2$  (b)  $h(x) = (x + 3)^2$  (c)  $j(x) = -(x - 1)^2$  (d)  $k(x) = (x + 4)^2 - 5$

8.) Given  $f(x) = x^2 + x$  and  $g(x) = 3x - 4$ , find the following: (a)  $(f + g)(x)$  (b)  $(f - g)(x)$   
(c)  $(f \cdot g)(x)$  (d)  $\left(\frac{f}{g}\right)(x)$  (e)  $f(g(x))$  (f)  $g(f(x))$

9.) Find the inverse for the following functions: (a)  $f(x) = 5x - 2$  (b)  $g(x) = \frac{4}{3}x + 1$  (c)  $h(x) = \frac{2x+1}{3x-5}$

10.) Simplify: (a)  $\frac{x^3-9x}{x^2-7x+12}$  (b)  $\frac{x^2-2x-8}{x^3+x^2-2x}$

11.) State the x- and y-intercepts, vertical and horizontal asymptotes, and holes: (a)  $f(x) = \frac{1}{x-2}$   
(b)  $g(x) = \frac{x^2-4}{x-2}$  (c)  $f(x) = \frac{3x+2}{4x+1}$

12.) Solve for x: (a)  $5^{x+1} = 25$  (b)  $\frac{1}{3} = 3^{2x+2}$  (c)  $\log_2 x = 3$

(d)  $\log_3 x^2 = 2 \log_3 4 - 4 \log_3 5$  (e)  $7 + \sqrt{4x + 8} = 9$  (f)  $\sqrt{x - 6} - \sqrt{x} = 3$

(g)  $\frac{10}{x+4} = \frac{15}{4x+4}$  (h)  $\frac{10}{x^2-2x} + \frac{4}{x} = \frac{5}{x-2}$

13.) Solve the system of equations:  $4x - y = 7$ ,  $x + y = 3$

14.) Graph the following functions, then state the domain and range (no calculator): (a)  $f(x) = -x^2 - 2x + 8$   
(b)  $g(x) = 2\sqrt{x-3} + 1$  (c)  $h(x) = \frac{6x+1}{2x-1}$  (d)  $i(x) = 2^x - 3$  (e)  $j(x) = \log_5(x + 2)$