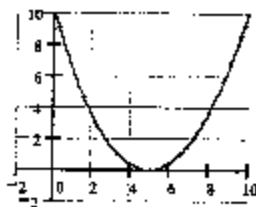
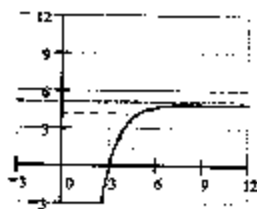


- 5.) (10 pts) The graphs of f and g are given in the figures below, along with the asymptote to the graph of g .



$y = f(x)$



$y = g(x)$

Using the graphs, determine approximate values (to the nearest integer) for each of the following:

- (a) $f(g(3)) = 10$ (b) $g^{-1}(f(8)) = 4$ (c) $f^{-1}(0) = 5$
 $\leftarrow f(5) = 10$ $\leftarrow g(4) = 8$
- (d) $f(g(1,000,000)) = 0$ (e) $g(g^{-1}(3)) = 3$
 $\approx f(5)$

- 6.) (15 pts) Determine the zeros (if any) and describe the behavior as $x \rightarrow \infty$ of the following functions: [No explanation necessary.]

(a) $f(x) = \frac{5(x+1)(1-x)}{(x+2)(x-3)}$ as $x \rightarrow \infty \approx \frac{-5x^2}{x^2} = -5$ zeros: $x = -1, x = 1$

as $x \rightarrow \infty, f(x) \rightarrow -5$

(b) $g(x) = \frac{(x^2+1)}{(x+2)}$ as $x \rightarrow \infty \approx \frac{x^2}{x} = x$ zeros: None

as $x \rightarrow \infty, g(x) \rightarrow \infty$

(c) $h(x) = -2x(x-3)(x+4)$ zeros: $x = 0, x = 3, x = -4$

cubic with negative leading co-eff. \rightarrow

as $x \rightarrow \infty, h(x) \rightarrow -\infty$

(d) $j(x) = (x-2)^3(3x+1)$ zeros: $x = 2, x = -\frac{1}{3}$

quartic with positive leading co-eff. \rightarrow

as $x \rightarrow \infty, j(x) \rightarrow \infty$

- (e) Using the function from part (d), write a formula for $m(x)$, given $m(x) = j(x-1)$. [No need to "expand," but do simplify.]

$$m(x) = ((x-1)-2)^3(3(x-1)+1)$$

$$= (x-3)^3(3x-2)$$

$$m(x) = (x-3)^3(3x-2)$$