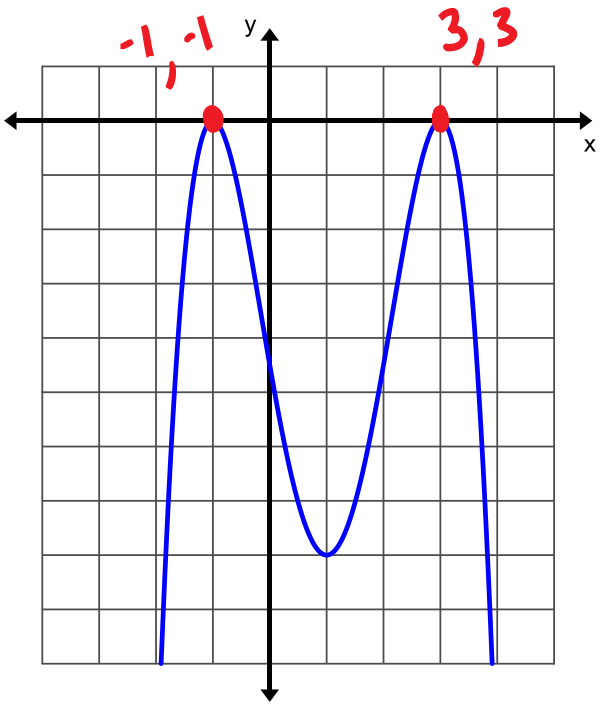
Functions & Trig. Name _____
Polynomials, Inverse, Rate of Change

1.) Which statement about this polynomial graph is correct?



(A) The graph has four non-repeating real roots.

(B) The graph has two pairs of repeating real roots.

(C) The graph has two real roots.

(D) The graph has three real roots.

2.) Write the expression $\frac{6x^3+17x^2+10x+2}{2x+3}$ in $q(x)+\frac{r(x)}{d(x)}$ form.

$2x+3=0$

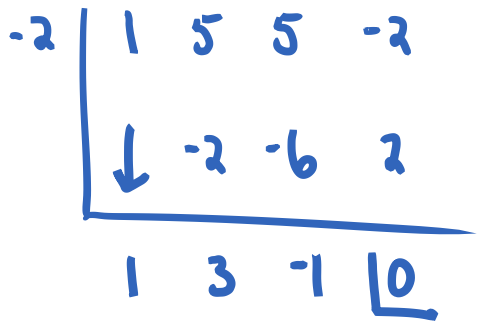
$\frac{2x}{2}=\frac{-3}{2}$

$x=\frac{-3}{2}$

$-\frac{3}{2}$	6	17	10	2
	↓	-9	-12	3
Divide by 2 →	6	8	-2	5

$3x^2+4x-1+\frac{5}{2x+3}$

3.) Determine if $x+2$ is a factor of x^3+5x^2+5x-2. **Explain your answer.**



$x+2=0$

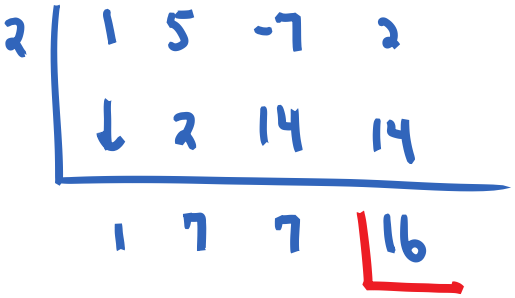
$x=-2$

Yes, since the remainder of the quotient is zero.

4.) Given $f(x)=x^3+5x^2-7x+2$ find the value of $f(2)$.

$(2)^3+5(2)^2-7(2)+2$

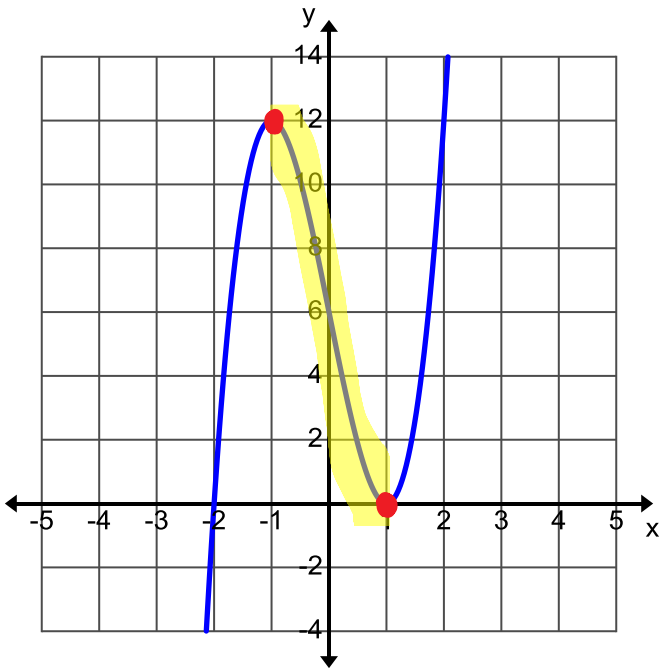
16



b. What does your answer tell you about $x-2$ as a factor of $f(x)$? **Explain.**

x-2 is not a factor since the remainder is not zero.

5.) Given the graph of $g(x)$, find



a. Find the average rate of change over the interval $[-1,1]$

$\frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{12 - 0}{-1 - 1} = \frac{12}{-2} = -6$

b. Using the graph above, which statement is correct about the end behavior of the graph?

(A) as $x \to -\infty$, $f(x) \to \infty$; $x \to \infty$, $f(x) \to \infty$

(B) as $x \to -\infty$, $f(x) \to -\infty$; $x \to \infty$, $f(x) \to -\infty$

(C) as $x \to -\infty$, $f(x) \to -\infty$; $x \to \infty$, $f(x) \to \infty$

(D) as $x \to -\infty$, $f(x) \to \infty$; $x \to \infty$, $f(x) \to -\infty$

6.) Given $f^{-1}(x) = -\frac{3}{4}x + 2$, which equation represents $f(x)$?

Inverse → switch x and y

(a) $f(x) = \frac{4}{3}x - \frac{8}{3}$ (b) $f(x) = -\frac{4}{3}x + \frac{8}{3}$

(c) $f(x) = \frac{3}{4}x - 2$ (d) $f(x) = -\frac{3}{4}x + 2$

$x = -\frac{3}{4}y + 2$

$-2 \quad -2$

$-\frac{4}{3}(x - 2) = -\frac{3}{4}y \cdot -\frac{4}{3}$

$-\frac{4}{3}x + \frac{8}{3} = y$