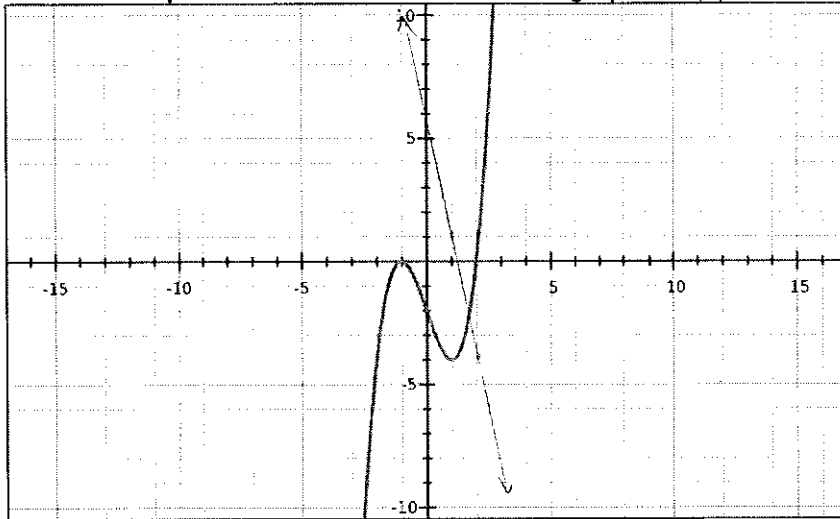


Name: KEY  
Date: \_\_\_\_\_

Use the graph and information below for questions #1 - 4.

1) Write the equation in standard form of the graph of  $f(x)$  shown below. (4pts)  $x^3 - 3x - 2$



$(x+1)(x+1)(x-2)$   
 $(x^2+2x+1)(x-2)$

	$x^2$	$2x$	$1$
$x$	$x^3$	$2x^2$	$x$
$-2$	$-2x^2$	$-4x$	$-2$

2) Find  $f(3)$ . (2pts)  
(2pts)

$$\begin{aligned} f(3) &= (3)^3 - 3(3) - 2 \\ &= 27 - 9 - 2 \\ &= 16 \end{aligned}$$

$f(3) = 16$

3) A second function  $g$  is defined by  $g(x) = -4x + 5$ . Select the phrase in each box to complete the sentence.

$f(4)$  is greater than/less than  $g(4)$  and  $f(-2)$  is greater than/less than  $g(-2)$ . (6pts)

4)  $f(x)$  and  $g(x)$  intersect at a point. Find the  $x$ -coordinate of the point. (6pts)

$$\begin{aligned} x^3 - 3x - 2 &= -4x + 5 \\ x^3 + x - 7 &= 0 \end{aligned}$$

Algebra 2H  
Polynomials Test REVIEW

5) What is one strategy for finding a factor of a polynomial function? (3pts)

6) Let an integer be represented by  $x$ . Find, in terms of  $x$ , the product of three consecutive integers, starting with  $x$ . (3pts)

$$x(x+1)(x+2)$$

$$x(x^2 + 3x + 2)$$

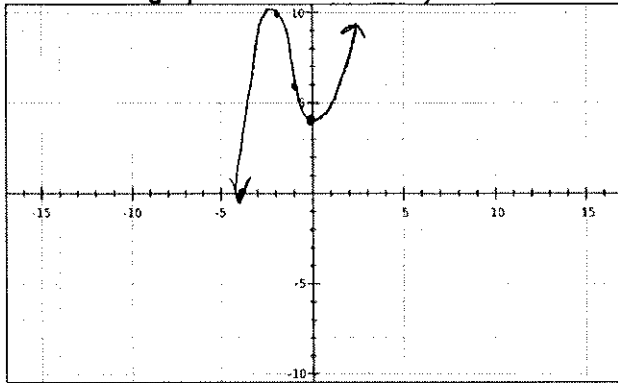
$$x^3 + 3x^2 + 2x$$

7) If the domain of the above function is restricted to  $[-5, 5]$ , what is the maximum value of the product of that function?

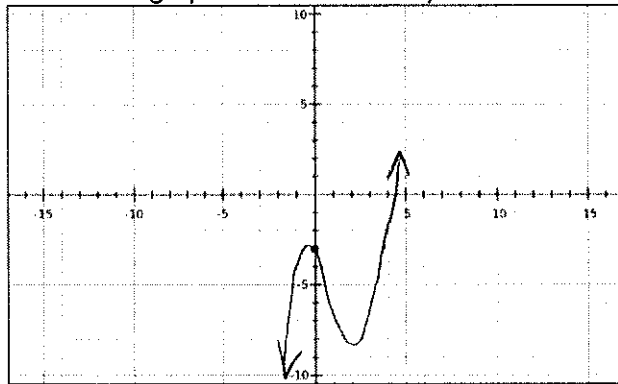
$$210$$

Algebra 2H  
Polynomials Test REVIEW

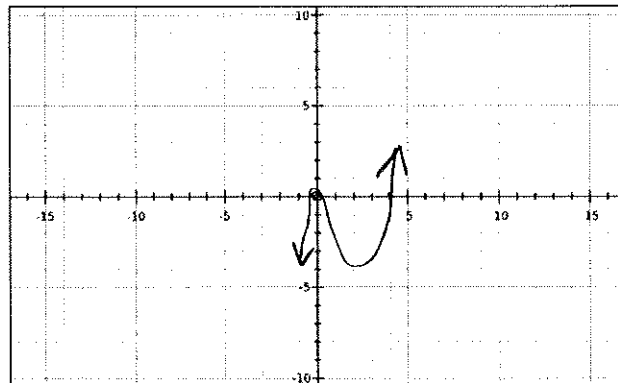
8) Sketch the graph of the function  $y = x^3 + 4x^2 + x + 4$ . (6pts)



9) Sketch the graph of the function  $y = 4x^3 - 16x^2 - 11x - 3$ . (6pts)



10) Sketch the graph of the function  $y = 2x^3 - 7x^2 - 4x$ . (6pts)



11) The graphs of the above three functions look different. Choose one of the three functions and determine why that graph is unlike the other two. Use information from both the equations and the graphs to justify your reasoning. (6pts)

Algebra 2H  
Polynomials Test REVIEW

- 12) Find all **possible** roots of:  
 $2x^4 + 7x^3 - 10x^2 + x + 5 = 0.$   
 (3pts)

$$\pm 1, \pm 5, \pm \frac{1}{2}, \pm \frac{5}{2}$$

- 13) Write in standard form the polynomial with rational coefficients that has the roots 3 and  $\sqrt{6}$ . (3pts)

$$(x-3)(x-\sqrt{6})(x+\sqrt{6})$$

$$(x-3)(x^2-6)$$

$$\boxed{x^3 - 3x^2 - 6x + 18}$$

- 14)  $8x^3 + 8 = 0$   
 (4pts)

$$x^3 + 1 = 0$$

$$\begin{array}{r} x^2 - x + 1 \\ x+1 \overline{) x^3 + 0x^2 + 0x + 1} \\ \underline{-(x^3 + x^2)} \phantom{+ 1} \\ -x^2 + 0x \phantom{+ 1} \\ \underline{-(-x^2 - x)} \phantom{+ 1} \\ x + 1 \end{array}$$

$$x = -1, \frac{1 \pm \sqrt{3}}{2}$$

$$x = \frac{1 \pm \sqrt{(-1)^2 - 4(1)(1)}}{2}$$

$$x = \frac{1 \pm \sqrt{-3}}{2}$$

- 15)  $x^4 - 5x^2 - 6 = 0$   
 (4pts)

$$\begin{aligned} x^4 - 6x^2 + x^2 - 6 &= 0 \\ x^2(x^2 - 6) + 1(x^2 - 6) &= 0 \\ (x^2 + 1)(x^2 - 6) &= 0 \end{aligned}$$

$$x = \pm i, \pm \sqrt{6}$$

- 16)  $5x^3 - 10x^2 + 3x - 6 = 0$

$$\begin{array}{r} 5x^2 + 3 \\ x-2 \overline{) 5x^3 - 10x^2 + 3x - 6} \\ \underline{-(5x^3 - 10x^2)} \phantom{+ 3x - 6} \\ 3x - 6 \end{array} \rightarrow \begin{aligned} 5x^2 + 3 &= 0 \\ 5x^2 &= -3 \\ x^2 &= -\frac{3}{5} \end{aligned}$$

$$x = 2, \pm i\sqrt{\frac{3}{5}}$$