

## Algebra 2 Chapter 4 Practice Problems

Name: \_\_\_\_\_

The purpose of these problems is to help you review the concepts of the chapter. The problems on the test may or may not look similar.

1. Simplify the following using long division

$$\frac{3x^4 + x^3 - 11x^2 - 4x - 1}{x^2 - 4}$$

2. Graph the following functions. Mark the zeroes clearly.

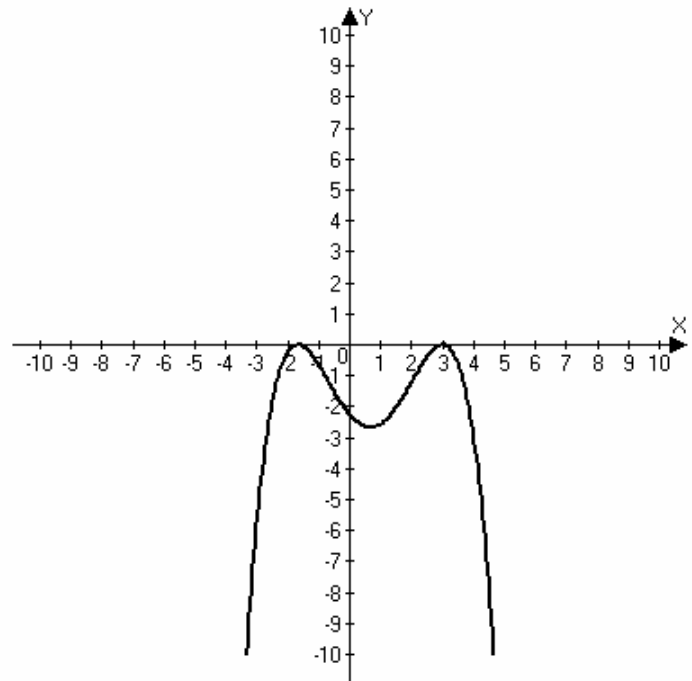
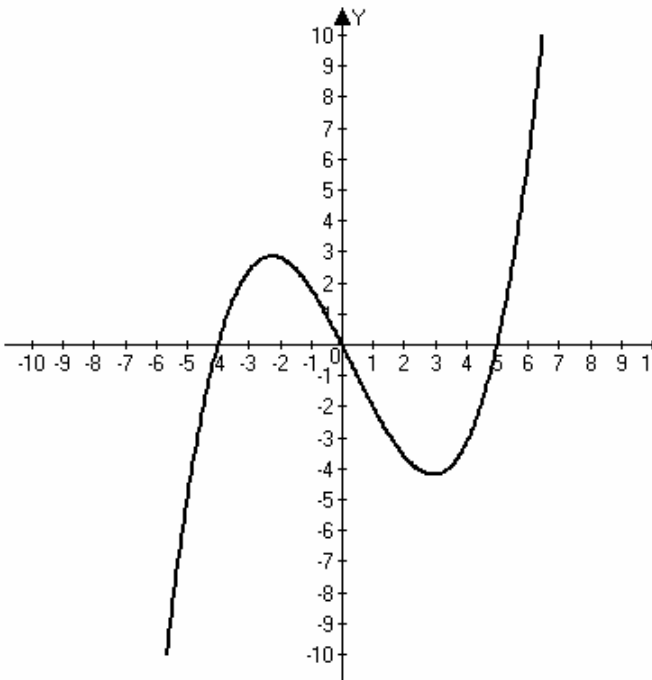
$$y = (x - 3)(2x + 5)(x + 1)(x + 7)$$

$$y = -2(x + 5)^2(3x - 2)$$

3. Give a possible equation for the following graphs. You may leave your answer in factored form but use only integer coefficients. (Approximate zeroes as best you can)

a)  $y =$  \_\_\_\_\_

b)  $y =$  \_\_\_\_\_



4. Find  $p(x)$  if  $x + 4 \overline{) \begin{matrix} x - 3 \\ R6 \end{matrix} p(x)}$

5. Solve this inequality (we have done it before, do it the old way or think about how what we have learned this chapter can help)

$$(x + 6)(3x - 8)(x - 5) \geq 0$$

6. **Extra Credit:** If  $p(x) < 0$  has a solution of  $(-\infty, -3) \cup (-1, 4) \cup (4, 7)$ , give a formula for  $p(x)$  in any form

7. Give the equation of a cubic polynomial using only integer coefficients that has zeroes of 4 and  $2 - i$ .
8. Extra Credit: Give a 4<sup>th</sup> degree polynomial equation that has possible rational roots of  $\pm 1, \pm \frac{1}{2}, \pm \frac{1}{3}, \pm \frac{1}{5}, \pm \frac{1}{6}, \pm \frac{1}{30}$
9. List the possible rational roots (not in one giant fraction form) of  $4x^5 - 6x^3 + 7x^2 - 5x + 5 = 0$
10. Solve the equation  $2x^3 - 3x^2 + 32x - 48 = 0$  if  $\frac{3}{2}$  is a solution.
11. Solve this equation  $x^4 - 5x^2 - 36 = 0$
12. Honors/ Extra Credit: By hand, graph  $y = \frac{(x-3)(x+2)}{x(x+3)}$ . Indicate clearly the zeroes, horizontal asymptote(s) and vertical asymptote(s).
13. Extra Credit:  $P(x) = x^7 + 2kx^3 + kx^2 + 2x - 7$  is divisible by  $x + 1$ . Find the value of  $k$ .

Answers:

1.  $3x^2 + x + 1, R3$
2. see your teacher
3.  $y = x(x+4)(x-5)$     b)  $y = -(x-3)^2(7x+4)^2$
4.  $p(x) = (x+4)(x-3) + 6 = x^2 + x - 6$
5.  $x \geq 5$  or  $-6 \leq x \leq \frac{8}{3}$
6.  $p(x) = (x+3)(x+1)(x-4)^2(x-7)$
7.  $x^3 - 8x^2 + 21x - 20$
8.  $\pm 30x^4 + \dots \pm 1 = 0$
9.  $\pm 1, \pm 5, \pm \frac{1}{2}, \pm \frac{1}{4}, \pm \frac{5}{2}, \pm \frac{5}{4}$
10.  $\frac{3}{2}, \pm 4i$
11.  $\pm 3, \pm 2i$
12. check with calculator
13.  $k = -10$