Algebra II – Mrs. Tilus Name: _____
Unit 8 Review

1. Divide. You may use long **or** synthetic division.

a) $\frac{2x^3+3x-5}{x+2}$ b) $\frac{10x^2+x-3}{5x+3}$ c) $\frac{3x^4+x^3-2x+7}{x^2-x+1}$

2. **<u>Use synthetic substitution</u>** to find P(c) for the given polynomial P(x) and the given number c.

$P(x) = x^3 + 2x^2 - 6x - 4$; $c = -2$

P(-2)=

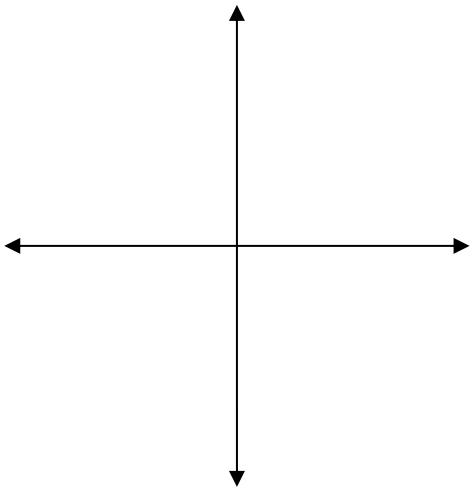
3. Use the factor theorem to determine whether x + 1 is a factor of P(x). Show your work to receive full credit, and circle the answer.

P(x) = $x^{12} - 3x^8 - 4x - 2$ Circle one: Factor or Not a Factor

4. Consider the polynomial $2x^3 - 5x^2 - 4x + 3$.

a) State the <u>number</u> of possible factors.

b) State all of the possible roots by using the rational root theorem.



c) Draw a graph of the polynomial.
(Include tick marks for x-axis)

d) By using the calculator and/or synthetic division, write the polynomial in factored form.

Factors: { _____ }

5. Write a third-degree equation which has solutions of $x = -3i$, and $x = 5$.

6. Answer each question.

a) What is true about the tails of an even degree function?

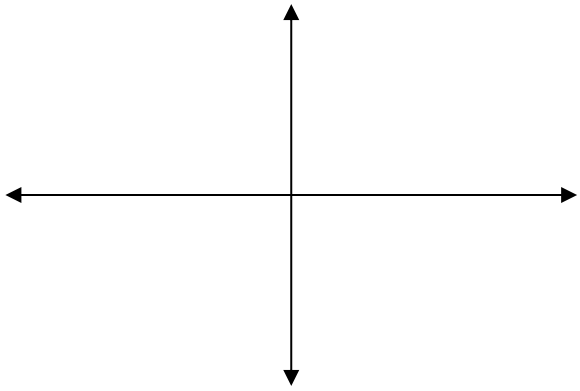
b) What is the maximum number of "bumps" in a 6^{th} degree polynomial?

c) Can an even degree polynomial have no x-intercepts?

d) Can an odd degree polynomial have no x-intercepts?

e) Can a polynomial with real coefficients have only one imaginary root?

7. Draw a graph for a fourth-degree polynomial equation that has two real roots.

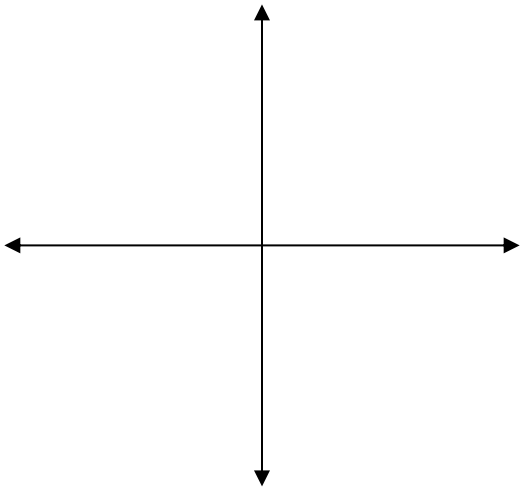


8. Given the following entries from a table for a function L, use linear interpolation to estimate x to three significant digits if L(x) = 0.525.

x	1.5	1.6	1.7	1.8
L(x)	0.405	0.470	0.531	0.588

9. Consider the function $y = x^3 + 3x^2 + 16x + 48$

a) Draw a graph of the function. **(Include tick marks for x-axis)**



b) Find the values of the **real** zeros of the function.

c) Find the values of the **imaginary** zeros of the function.

Zeros: { _____ }

10. If r is **directly** proportional to s + 1, and r = 4 when s = 5, find r when s = 8.

$K =$ _____

$r =$ _____

11. The distance an object falls from rest is directly proportional to the square of the length of time it has fallen. If an object falls 64 feet in 2 seconds, how far will it fall in 3 seconds?

$K =$ _____

$D =$ _____

12. If y varies **inversely** with x, and y = 5 when x = 4, find x when y = 10.

$K =$ _____

$x =$ _____