Chapter 2 Review Name _____ Assignment # _____

1. Find $P\left(\frac{5}{7}\right)$ and P(5i) if $P(x)=7x^3+9x^2-31x+4$

2. Give the quotient and remainder when $5x^3-7x+8$ is divided by $x-1$

3. Without using division or synthetic substitution, determine if the following a factor of $P(x)=x^{50}-3x^3-37x^2+27x+12$. Explain your answer.

A: $(x-1)$

B: (x + 1)

4. Find k so that 2 is a zero of $P(x)=\left(3x^2+kx-8\right)$

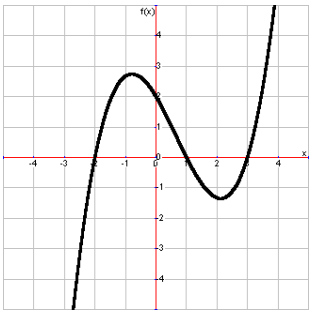
5. Find the remaining roots if 2 and 5 are roots of $x^4-3x^3-14x^2+12x+40=0$

6a. Sketch the graph of $y=x(x-2)(x+3)$

6b. Sketch the graph of $y=x(x-2)(x+3)^2$

7. When a polynomial is divided by (x – 4), the quotient is $x^2 - 3x - 1$ and the remainder is 2. Find the polynomial.

8. Give an equation of the following graph



9. Find the upper and lower bound for $2x^3 - 5x^2 - 2x + 1 = 0$?

10. Between what 2 consecutive integers are the real roots of $x^3 + 5x^2 - 3 = 0$

11. Solve:
$x^4 - 5x^2 - 36 = 0$

12. Solve $x^3 + 3x^2 - 8x - 24 = 0$

13. Solve $2x^3 - 5x^2 + 22x - 10 = 0$. List all the possible rational zeros and use synthetic division.

14. Show that $P(x) = x^4 - 5x^3 + 9x^2 - 2x - 11$ have a real zero between 2 and 3.

15. Find a cubic equation with integral coefficients having roots ½ and 1 + 3i.

16. Find the sum and product of the roots of

a) $753x^2 - 2490x + 1 = 0$

b) $12x^3 - 18x^2 + 5x + 81 = 0$

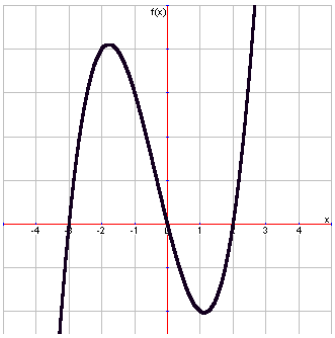
c) $12x^3 + 5x + 81 = 0$

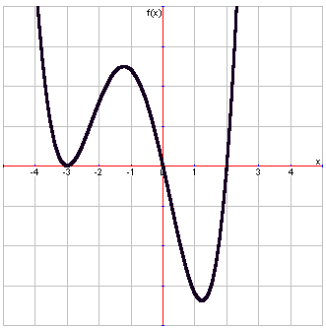
d) $12x^4 + 5x^3 + 6x = 0$

17. $P(x) = x^5 - 9x^4 + 6x^2 - x - 7$

Use Descartes' Rule of Signs to fill a chart with columns Total roots, positive real, negative real, and imaginary. List all possibilities.

Don't forget to review the word problems worksheet

1. -11; -221 – 1030i
2. $Q(x)=5x^2+5x-2$; Remainder 6
3. A. Yes because using direct substitution, P(1) = 0;
   B. No because using direct substitution, P(-1) = -48 and not zero.
4. k = -2
5. -2 (double root)
6. 



7. $P(x) = x^3 - 7x^2 + 11x + 6$
8. $y = 1/3(x+2)(x-3)(x-1)$
9. Upper bound : 3 Lower bound : -1
10. -5 and -4; -1 and 0; 0 and 1
11. ±3, ±2i
12. $-3;\pm 2\sqrt{2}$
13. Rational zeros: $\pm 1, \pm 2, \pm 5, \pm 10, \pm\frac{1}{2}, \pm\frac{5}{2}$. Roots: ½ , 1±3i
14. P(2) = -3, and P(3)=10. The y values go from -3 to 10 so there must be some number between 2 and 3 where y is 0.
15. $2x^3 - 5x^2 + 22x - 10 = 0$
16a) Sum = $\frac{2490}{753}$; Product = $\frac{1}{753}$
16b) Sum $-\left(-\frac{18}{12}\right)=\frac{3}{2}$; Product = $-\frac{81}{12}=\frac{-27}{4}$
16c) Sum: 0 ; Product $-\frac{81}{12}=\frac{-27}{4}$
16d) Sum: $-\frac{5}{12}$; Product: 0
17.

Total Roots	Pos	Neg	Imaginary
5	3	2	0
5	3	0	2
5	1	2	2
5	1	0	4