Polynomial Functions Name ________________________________
Review WS 1

1. Let $P(x) =$ a polynomial where $P(1)=0, P(2)=0, P(-3)=0$. Factor $P(x)$ completely.

2. Find the zeros of $f(x)=x^3+x^2-4x-4$. Show work.

3. If $P(x) =$ polynomial that is divided by $x-2$. Then remainder is the same as (select one answer)
   a) $P(2)$ b) $P(-2)$ c) 2 d) –2

4. Find *k* so that $x-3$ is a factor of $2x^3-7x^2+4x+k$

5. The possible rational roots of $f(x)=3x^4-5x^3+2x-8$ are

6. One factor of x^3-4x^2+x+6 is $x-3$. Find the other factors.

7. Find a polynomial function of 4th degree, in standard form, with zeros of $3i$ and $1-2i$.

8. Given $P(x)$ such that $P(-5)=41, P(0)=3, P(4)=0, P(1)=5$ find:
   a) a factor of $P(x)$
   b) remainder when $P(x)$ is divided by $x+5$
   c) zero
   d) y-intercept

9. Graph: $f(x)=(x-1)^2(x-3)(x+2)$

10. Find all the zeros: $f(x)=x^4-4x^3+x^2+16x-20$

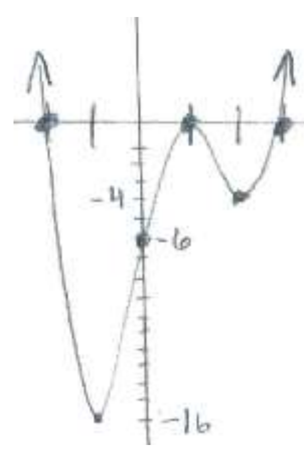
11. Find the value of $f(5)$ for $f(x)=x^3-3x^2+3x-6$ using synthetic division.

12. Given $x+2$ is a factor of $f(x)=2x^3-x^2-7x+6$, find the zeros.

13. Solve by factoring: a) $3x^3+81=0$ b) $5x^4-45=0$ c) $x^4-9x^2+20=0$

Answers:

1. $P(x)=(x-1)(x-2)(x+3)$
2. x = –2, –1, 2
3. a)
4. Hint: set up and work synthetic substitution as far as you can and work backwards … k **=** –3
5. It just asked for the **possibles**! $\pm\left(1,2,4,8,\frac{1}{3},\frac{2}{3},\frac{4}{3},\frac{8}{3}\right)$
6. factors: (x – 3)(x – 2)(x + 1)
7. $f(x)=x^4-2x^3+14x^2-18x+45$
8. a) (x – 4) b) 41 c) x = 4 d) (0, 3)
9. see graph to the right



10. $x=\pm 2, 2\pm i$
11. $f(5)=59$
12. x = –2, 1, 3/2
13. a) –3, $\frac{3\pm 3i\sqrt{3}}{2}$ b) $\pm\sqrt{3}, \pm i\sqrt{3}$ c) $\pm 2, \pm\sqrt{5}$