Chapter 5 Practice Test

1) $f(x) = (x - 4)^2(2x + 6)$

a) List each x-intercept (zero) and its multiplicity (round to 2 decimal places when needed)

$$(4,0) \, mulitplicity \, 2 - even \, (-3,0) \, multiplicity \, 1 - odd$$

b) Determine whether the graph crosses or touches the x-axis at each x-intercept

$touches \, (4,0) \, crosses \, at \, (-3,0)$

c) Determine the maximum number of turning points on the graph $\, max \, 2 \, turning \, points$
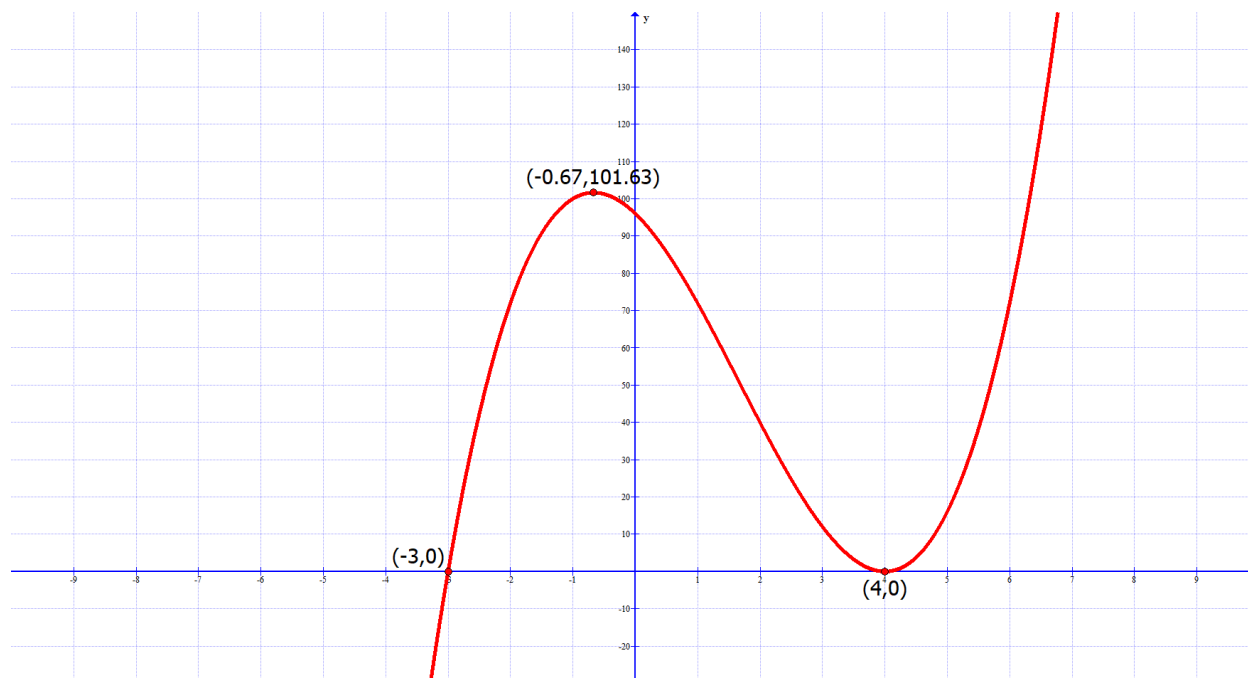
d) Sketch a graph and approximate the turning points, also label the x-intercepts (see graph)

e) Describe the end behavior (find the power function that the graph resembles for large values of $|x|$

$f(x) = 2x^3$

f) State the intervals where the function is increasing and decreasing

$increasing \, (-\infty, -0.67) \cup (4, \infty) \, decreasing \, (-0.67, 4)$

2) $f(x) = 2(x - 2)(x + 5)^2$

3) $f(x) = 6x^3 - 29x^2 - 17x + 60$

a) use your graphing calculator, or the rational root theorem to find a x-intercept of the polynomial $(x = 5)$

b) use synthetic division to completely factor the polynomial $f(x) = (2x + 3)(3x - 4)(x - 5)$

c) Use your answer to part a to solve f(x) = 0 $x = 5, \frac{-3}{2}, \frac{4}{3}$

4) $f(x) = x^2 + 25$

5) $f(x) = \frac{6x - 12}{x + 1}$

For each problem find the following:
a) the domain of $f(x)$ written in interval notation $(-\infty, -1) \cup (-1, \infty)$
b) the equation of the vertical asymptote (write none if there is no vertical asymptote) $x = -1$
c) the equation of the horizontal asymptote (write none if there is no horizontal asymptote) $y = 6$
d) x- intercept(s) if any (2,0)
e) y-intercept(s) if any $(0, -12)$
 (you do not need to graph the function)

6) $f(x) = \frac{x^2 + 2x - 15}{x - 1}$

For each problem find the following:
a) the domain of $f(x)$ written in interval notation $(-\infty, 1) \cup (1, \infty)$
b) the equation of the vertical asymptote (write none if there is no vertical asymptote) $x = 1$
c) the equation of the slant asymptote (write none if there is no slant asymptote) $y = x + 3$
d) x- intercept(s) if any (-5,0) (3,0)
e) y-intercept(s) if any (0,15)
 (you do not need to graph the function)