

Quiz 3

Key

Show *all* your work. No credit is given without reasonable supporting work. There are *two* sides to this quiz.

1. (WebHW8 #4) Let $p(x) = 2x^2 - 8x - 1$

(a) [1] Find the vertex of p

$$y = \frac{2x^2 - 8x - 1}{2}$$

$$\frac{1}{2}y = x^2 - 4x - \frac{1}{2}$$

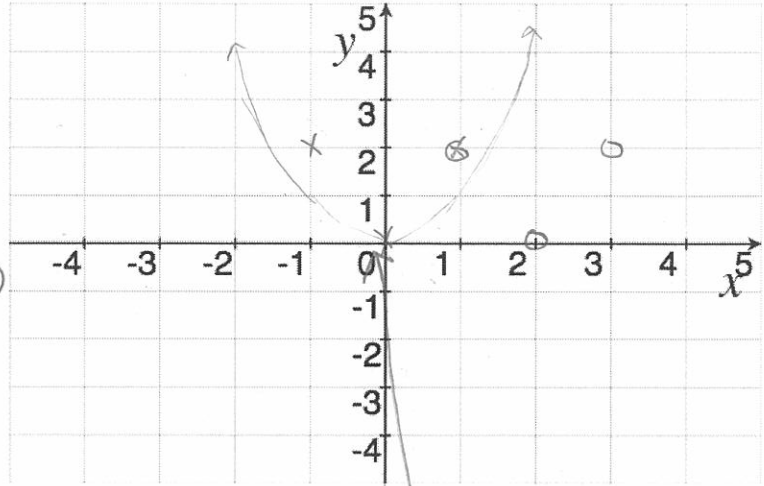
$$+ \left(\frac{-4}{2}\right)^2 \quad + \left(\frac{-1}{2}\right)^2$$

$$\frac{1}{2}y + 4 = (x^2 - 4x + 4) - \frac{1}{2}$$

$$\frac{1}{2}y + 4 = (x-2)^2 - \frac{1}{2}$$

$$\frac{1}{2}y = (x-2)^2 - \frac{9}{2}$$

$$\Rightarrow y = 2(x-2)^2 - 9$$



(b) [2] Graph p on the axes provided.

(+5) shape
(+5) get it

(+5) vertex sketch by 2
(+5) down by 9
(+5) right by 2 units

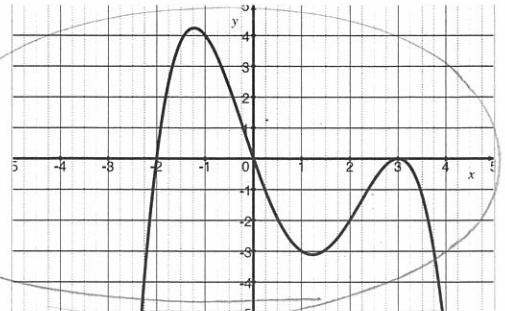
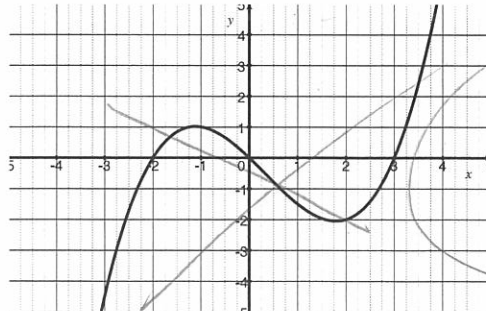
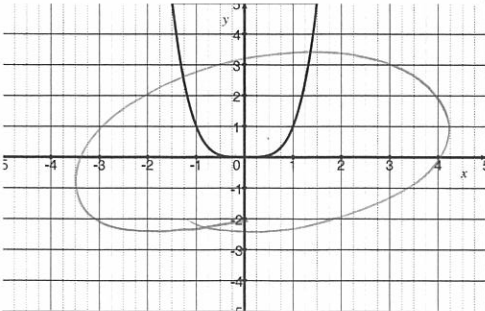
so $(2, -9)$ (+5)

or $h = -\frac{b}{2a}$

(+5) $= -\frac{-8}{2(2)} = \frac{8}{4}$

(+5) find $k = 2(2)^2 - 8(2) - 1 = -9$

2. [2] (PolynomialWks#6) Identify which of the graphs below could be the graphs of a 4th degree polynomial.



end behavior of
an odd degree polynomial

3. [1] Provide an example of a fifth degree polynomial.

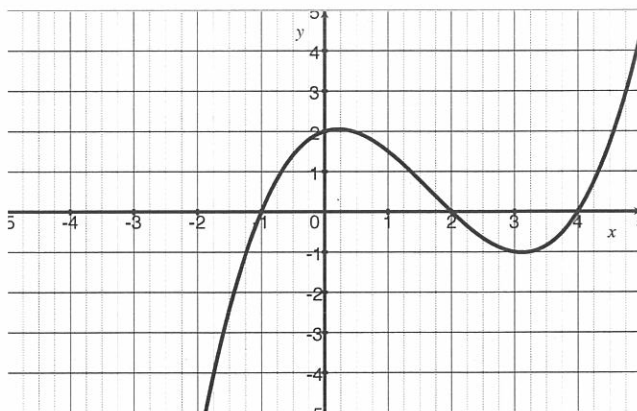
$$x^5 \quad \text{or} \quad (x+1)^5 \quad \text{or} \quad (x+1)(x-2)(x+5)^3$$

$$\text{or} \quad x^5 + 3x^2 - 3 \quad \text{etc}$$

4. Consider the function f graphed to the right.

- (a) [1] (WebHW9 #9) True or False:
The leading coefficient of f is negative.

False



- (b) [3] (§2.3 #28) Assume when f is completely factored, each real zero corresponds to a factor of the form $(x - c)^m$.
Find the equation of least degree for f .

(+1) {

- 1 is a root $\Rightarrow (x+1)$ is a factor
- 2 is a root $\Rightarrow (x-2)$ is a factor
- 4 is a root $\Rightarrow (x-4)$ is a factor

(+5) {

- @ $x = -1$ looks like a line $\Rightarrow (x+1)$ is a factor
- @ $x = 2$ looks like a line $\Rightarrow (x-2)$ is a factor
- @ $x = 4$ looks like a line $\Rightarrow (x-4)$ is a factor

So $f(x) = a(x+1)(x-2)(x-4)$

Passes thro $(0, 2)$ so

$$\begin{cases} 2 = a(0+1)(0-2)(0-4) \\ 2 = a \cdot 1(-2)(-4) \\ 2 = 8a \\ \Rightarrow a = 1/4 \end{cases}$$

also (+5)

(+5) { So $y = \frac{1}{4}(x+1)(x-2)(x-4)$