

Quiz 3

Key

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

1. Consider the function f graphed to the right.

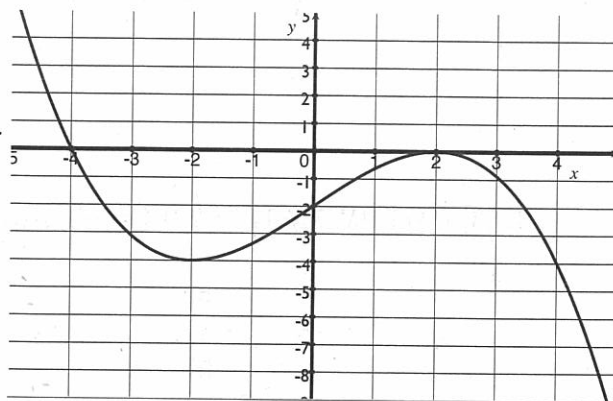
(a) [1] (WebHW6 #11) True or False:
The leading coefficient of f is positive.

(+1) False b/c as $x \rightarrow \infty$
 $y \rightarrow -\infty$

(b) [1] (Polynomial Wks #10)
True or False:
 f could be the graph of a 7th degree polynomial.

(+1) True b/c of end behavior
possibly $a(x+4)(x-2)^6 = y$

(c) [3] (§2.3 #38) Assume when f is completely factored, each real zero c corresponds to a factor of the form $(x - c)^m$. Find the equation of least degree for f .



(+1) $\left\{ \begin{array}{l} -4 \text{ is a root} \Rightarrow (x - (-4)) \text{ is a factor} \\ 2 \text{ is a root} \Rightarrow (x - 2) \text{ is a factor} \end{array} \right.$

(+1) $\left\{ \begin{array}{l} @ 2 \text{ touches but does not cross the } x\text{-axis} \Rightarrow (x - 2)^2 \text{ is a factor} \\ @ -4 \text{ the graph crosses the } x\text{-axis} \Rightarrow (x - (-4)) \text{ is a factor} \end{array} \right.$

So $y = a(x - 2)^2(x + 4)$

(+1) $\left\{ \begin{array}{l} \text{Passes thru } (0, -2) \text{ so } -2 = a(0 - 2)^2(x + 4) \\ -2 = a \cdot 4 \cdot 4 \\ -2 = 16a \\ -\frac{1}{8} = a \end{array} \right.$

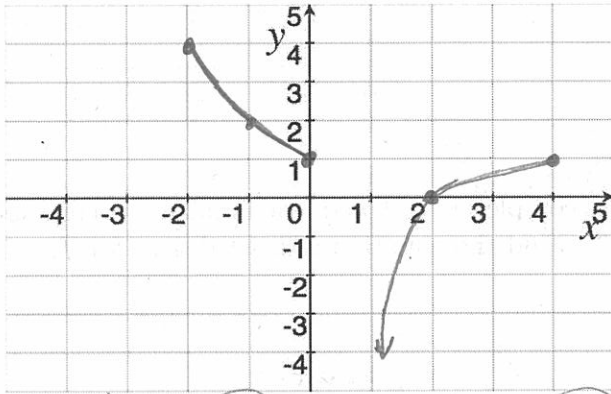
So $y = -\frac{1}{8}(x - 2)^2(x + 4)$

2. [2] (Exponent Wks page 4#2) Simplify $\frac{a^2b^{-2}}{a^{-1}b}$

$$\frac{a^2b^{-2}}{a^{-1}b} = \frac{a^2a}{b^2b} = \frac{a^3}{b^3}$$

neg exp (+) combine powers of a & b (+)

3. [3] (WebHW7 #14 & 22) Graph g where: $g(x) = \begin{cases} (\frac{1}{2})^x & \text{if } -2 \leq x \leq 0 \\ \log_3(x-1) & \text{if } 0 < x \leq 4 \end{cases}$



shift RIGHT one unit.

domains (+)

shape (+)
got + (+)

shape (+)
got + (+)