

Quiz 7

Math 111

Name:

Key

Show *all* your work algebraically for each and simplify. No credit is given without supporting work.

1. [9] A complete graph of a polynomial function g is shown below.

(a) Could g be a polynomial?

yes (+1)

(b) Assuming g is a polynomial, is the degree of g even or odd?

odd (+1)

(c) Assuming g is a polynomial, is the leading coefficient of g positive or negative?

positive (+1)

(d) What are the real roots of g ?

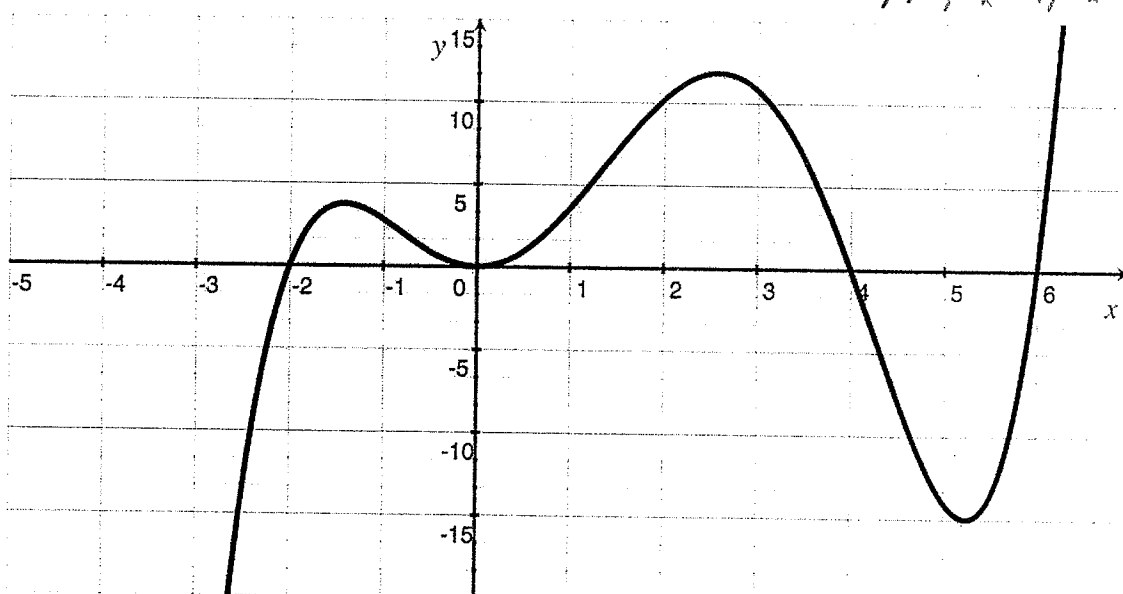
-2, 0, 4, 6 (+2)

(e) Assuming g is a polynomial, what is the smallest possible degree of g ?

5 (+1)

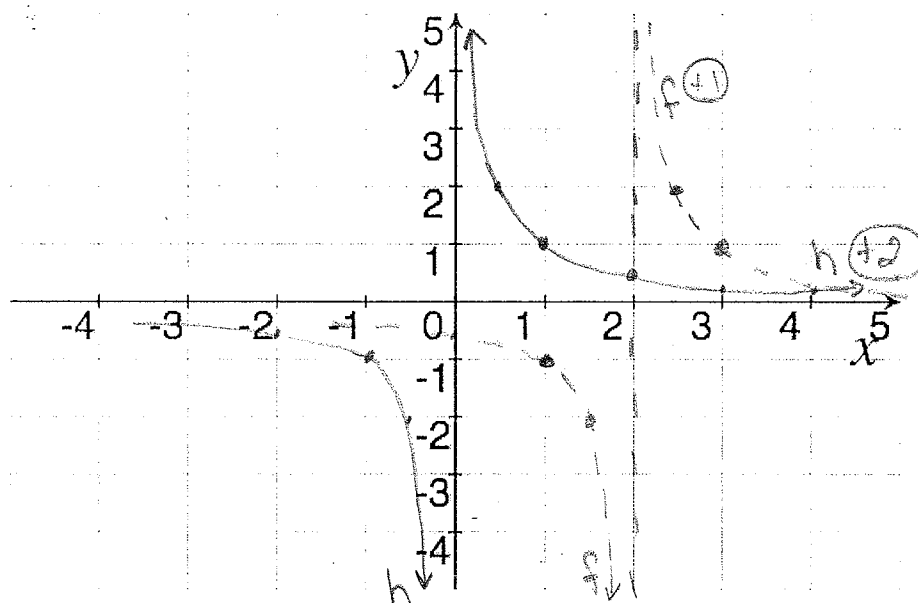
(f) Assuming g is a polynomial, list all the factors of g .

(x+2), x, x-4, x-6 (+3)



Sketch

2. [5] List the transformations needed to transform the graph of $h(x) = \frac{1}{x}$ into the graph of $f(x) = \frac{1}{x-2}$. Graph both h and f . Be sure to identify which one is which.



horiz shift
right by 2

(+2)

3. [6] Find and simplify the difference quotient of the function $f(x) = \frac{3}{x-2}$.

Recall the different quotient is $\frac{f(x+h) - f(x)}{h}$.

$$\frac{f(x+h) - f(x)}{h} = \frac{\frac{3}{x+h-2} - \frac{3}{x-2}}{h}$$

fac add (+1)

$$\frac{3(x-2) - 3(x+h-2)}{(x+h-2)(x-2)} \div h$$

$$= \frac{3x - 6 - 3x - 3h + 6}{(x+h-2)(x-2)} \div h$$

$$= \frac{-3h}{(x+h-2)(x-2)}$$

$$= \frac{-3}{(x+h-2)(x-2)} \quad \text{got it (+1)}$$

$$x^2 - 2x + xh - 2h - 2x + 4$$

$$x^2 - 4x + xh - 2h + 4$$