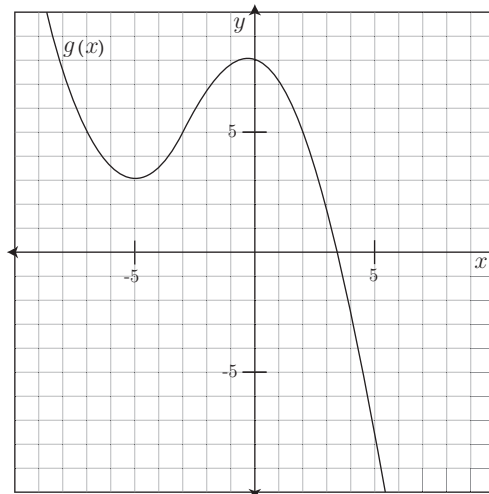


1. Find the  $x$ -intercepts of  $f(x) = \cos(x^2 - 1)$  for  $x \in \mathbb{R}$ .

2. Determine a reasonable equation for  $g(x)$  below.



3. Complete the table below if  $f$  is linear,  $g$  is quadratic, and  $h$  is exponential.

$t$	-3	-2	-1	0	1	2	3
$f(t)$	7	3					
$g(t)$	7	3	-5				
$h(t)$	7	3					

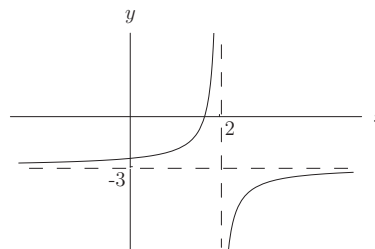
4. A person's weight varies (approximately) with the cube of their height. If Larry is 5'8" and weighs 160 pounds, how much would Aaron who is 6'2" weigh assuming his build is of similar proportion.

5. The base diameter of a tree (measured in cm) varies directly with the  $\frac{3}{2}$  power of its height (measured in meters).

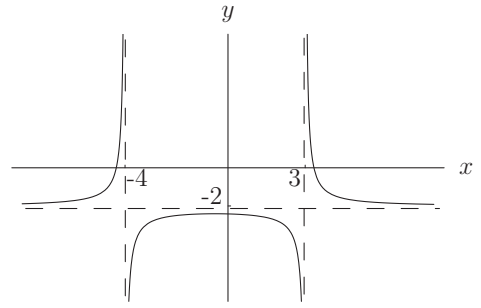
(a) If a tree 5 meters high has a base diameter of 14.5 cm, find the constant of proportionality and write a function relating the height and base diameter of any similar trees.

(b) Find the height of a tree with a base diameter of 238 cm.

6. The graph below is a translation of the function  $f(x) = \frac{1}{x}$ . Find a possible formula for the graph and apply algebra to write it as the ratio of two linear functions.



7. Give a possible equation for the function graphed below.



8. Determine the zeros,  $y$ -intercept, and asymptotes (vertical and horizontal) for the function below. Then sketch it.

$$g(x) = \frac{x^2 - 25}{x^2 - 4x - 12}$$

9. Suppose  $f(1) = 5$  and  $f(5) = 16$ . Find a possible formula for  $f$  if  $f$  is

(a) linear

(b) exponential

(c) power function

10. Find  $f^{-1}(x)$  for  $f(x) = \frac{2x-1}{5-3x}$ .