Practice Test 2

1. Given f(x) = x^2 +1 and g(x) = x – 1

a. Find (f+g)(x)

$x^2 + 1 + x - 1$

$(f+g)(x) = \boxed{x^2 + x}$

b. What is domain of (f+g)(x)

$\boxed{(-\infty, \infty)}$

c. Find (f+g)(2)

$x^2 + x$

$2^2 + 2$

$\boxed{6}$

d. Find (f/g)(x)

$\boxed{\frac{x^2+1}{x-1}}$

e. What is domain of (f/g)(x)

$x \neq 1$

$\boxed{(-\infty, 1) \cup (1, \infty)}$

f. Find (f/g)(2)

$\frac{x^2+1}{x-1}$

$\frac{2^2+1}{2-1} \rightarrow \frac{4+1}{1} = \boxed{5}$

Practice Test 2

2. Using the inverse function property prove that g(x) is the invers of f(x) given
   $f(x) = x^5 + 3$
   and
   $g(x) = (x-3)^{1/5}$

$f(g(x))$

$f((x-3)^{\frac{1}{5}})$

$((x-3)^{\frac{1}{5}})^5 + 3$

$x - 3 + 3$

x

✓

$g(f(x))$

$g(x^5+3)$

$(x^5+3-3)^{\frac{1}{5}}$

$(x^5)^{\frac{1}{5}}$

x

✓

3. Which of the following explains how the graph of g is obtained from the graph of f?

$f(x) = x^2$

$g(x) = -((x+2)^2) - 3$

shift 2 left

$f(x+2)$

$f(x) - 3$ shift down 3

a. Shift to the left 2, reflect across the y-axis, then move down 3
b. Shift to the right 2, reflect across the x-axis, then move down 3
c. Shift up 2, reflect across the x-axis, then move right 3
d. Shift up 2, reflect across the y-axis, then move down 3
e. Shift to the left 2, reflect across the x-axis, then move down 3

$-f(x)$ reflect across x-axis

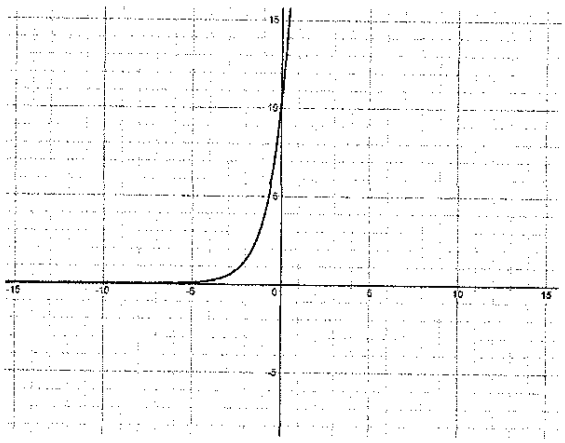
Practice Test 2

4. Write next to each graph which of the following equations matches it.

$A(t) = 10e^{1t}$ Interest

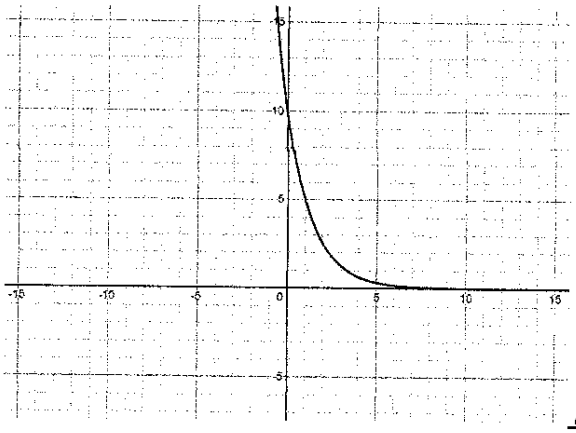
And

$A(t) = 10(1/2)^{t/1}$ Half Life

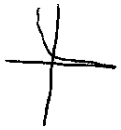


$a^x \quad a > 1$

$A(t) = 10e^{1t}$ or Interest



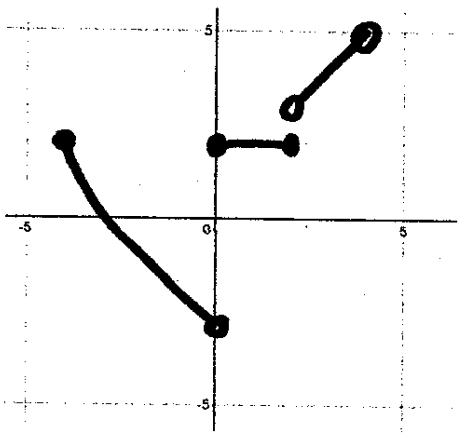
$a^x \; 0 < a < 1$



$A(t) = 10\left(\frac{1}{2}\right)^{\frac{t}{1}}$ or Half life

Practice Test 2

5. Answer the following questions about this graph of the function f.



a. Find f(0)

2

not -3, approaches doesn't reach

b. Find f(-3)

0

c. What is the Domain of f in interval notation.

$[-4, 4)$

d. What is the Range of f in interval notation.

$(-3, 2] \cup (3, 5)$

e. Find the values of x for which $f(x) \leq 0$

$[-3, 0)$

f. Find the net change in f between x = -4 and x = 3

$f(3) - f(-4)$

$4 - 2$

2

Practice Test 2

6. Use the Laws of Logarithms to evaluate the expression $(\log_2 10 + \log_2 3) - \log_2 5$. Get to the form $\log_a x$, you do not need to calculate exact number.

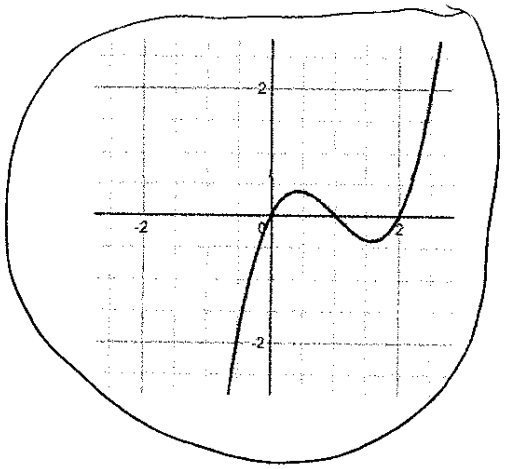
$(\log_2 10 + \log_2 3) - \log_2 5$

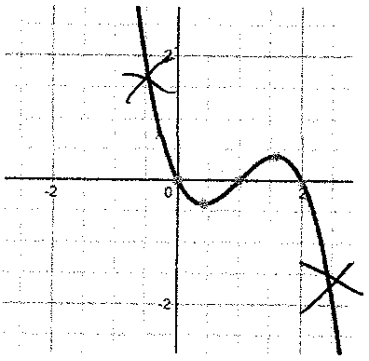
$\log_2 (10 \cdot 3) - \log_2 5$

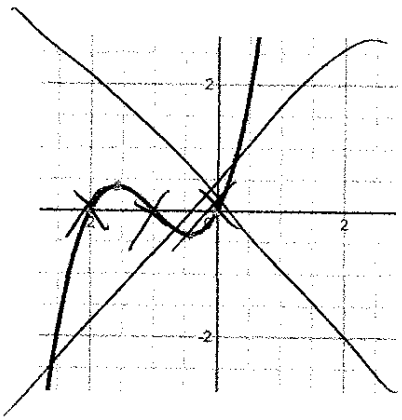
$\log_2 30 - \log_2 5$

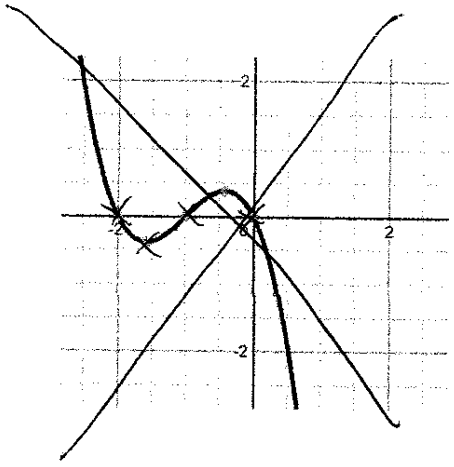
$\log_2 \frac{30}{5} \longrightarrow \boxed{\log_2 6}$

7. Circle graph of the function $f(x) = x(x-2)(x-1)$









Zeros 0, 2, 1

then find end behavior

$x(x-2)(x-1)$

↓

$x(x^2 - 3x + 3)$

↓

$x^3 - 3x^2 + 3x$

odd

positive

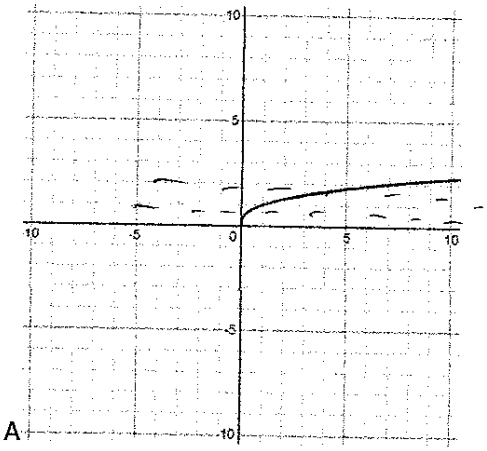
$x \to \infty \quad y \to \infty$

$x \to -\infty \quad y \to -\infty$

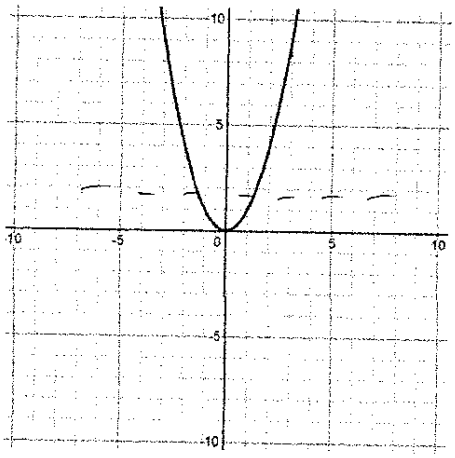
Or plug in values to find end behavior

8. List all of the following graphs that could represent one to one functions and explain your answer.

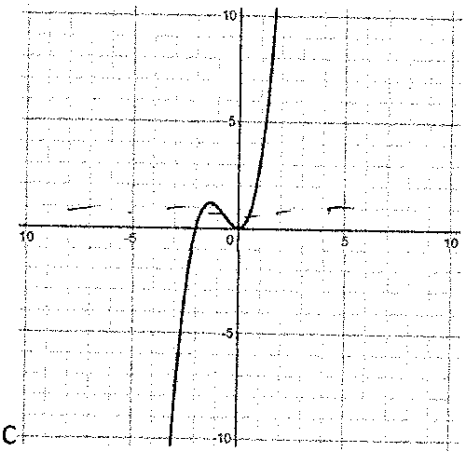
A



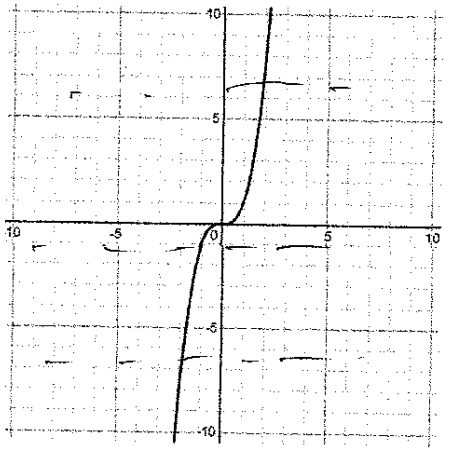
B



C



D



A and D because of the horizontal line test

Practice Test 2

9. Given the quadratic function $f(x) = -4x^2 + 16x - 11$

$\left(\frac{b}{2}\right)^2 \cdot \left(\frac{4}{2}\right)^2 = 4$

$-4 \cdot 4 = -16$

a. Express it in standard form $-4x^2 + 16x - 11$

$-4(x^2 - 4x + 4) \quad 16 \quad -11$

adding the 4 added -16 to function need to add 16 to balance

$f(x) = -4(x-2)^2 + 5$

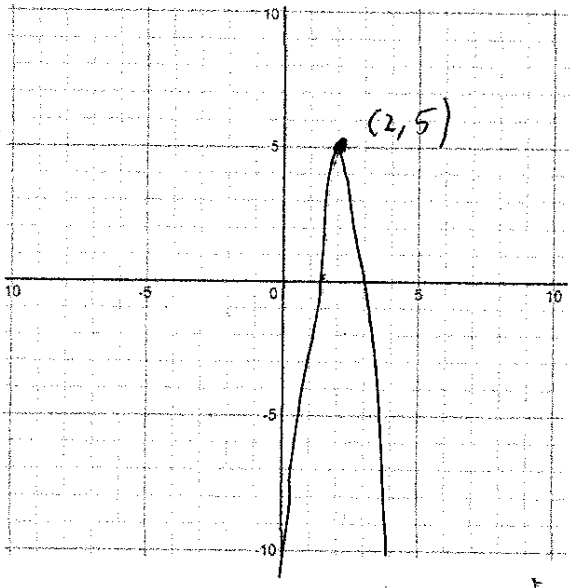
negate

b. Find the vertex $(2, 5)$

c. Graph the function

-4

so end behavior goes toward $-\infty$



approximate shape good enough

d. What is the domain in interval notation.

$(-\infty, \infty)$

e. What is the range in interval notation.

$(-\infty, 5]$