Given the parent function and a description of the transformation, write the equation of the transformed function, f(x).

1.   linear → vertical stretch of 4, left 5 and down 2

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

2.   cubic → $r_{x\text{-}axis}$, left 1, and up 2

$$f(x) = -\left((x+1)^3 + 2\right)$$

3.   square root → vertical compression of $\frac{1}{2}$, right 3, and up 4

$$f(x) = \frac{1}{2}\sqrt{x-3} + 4$$

4.   quadratic → $r_{x\text{-}axis}$, vertical stretch of 2, left 3, and down 1

$$f(x) = {}^{-}2(x+3)^2 - 1$$

Nov 28-12:24 PM

Dec 12-12:58 PM

1

Give the name of the parent function and describe the transformation (read left to right)

5. $h(x) = 4\sqrt{x-5}$

Parent: $P(x) = \sqrt{x}$

Transformation(s):
Vertical stretch 4
right 5

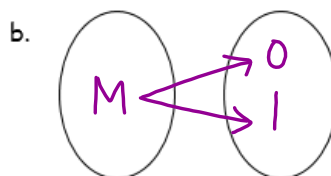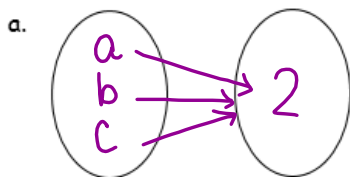6. $g(x) = 2|x-3| + 1$

Parent: $P(x) = |x|$

Transformation(s):
Vertical stretch 2
right 3
up 1

Nov 28-12:24 PM

7. Given the mapping diagram:
    a. write members of the domain and range and connect them with arrows so that f is a function and f^{-1} is not a function.
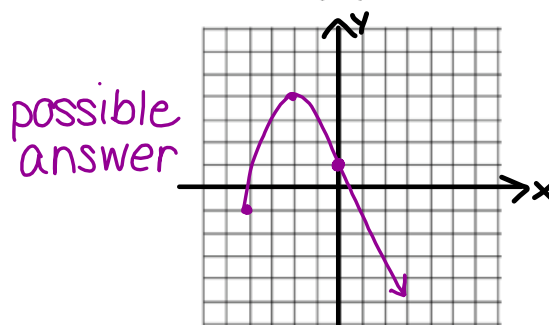   b. write members of the domain and range so that f is not a function and f^{-1} is a function.

examples

a.

a → 2
b → 2
c → 2

b.

M → 0
M → 1

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2

8. On the accompanying graph, draw a function that has the following properties:

   a. Domain: $[-4, \infty]$
   b. Range: $[-\infty, 4]$
   c. y-intercept: $(0, 1)$
   d. as $x \to \infty$, $y \to -\infty$

possible answer

Nov 28-12:25 PM

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9. Given $f(x) = 2x - 3$ and $g(x) = -x + 4$, perform the operation or composition. State domain restrictions if they exist.

   a. $f(g(x)) = f(-x+4)$
   $$= 2(-x+4) - 3$$
   $$= -2x+8-3$$
   $$f(g(x)) = -2x+5$$

   b. $f(x) \cdot g(x) = (2x-3)(-x+4)$
   $$= -2x^2 + 8x + 3x - 12$$
   $$= -2x^2 + 11x - 12$$

   c. $g(x) - f(x) = (-x+4) - (2x-3)$
   $$= -x + 4 - 2x + 3$$
   $$= -3x + 7$$

   d. $\left(\frac{g}{f}(x)\right) = \frac{g(x)}{f(x)}$
   $$= \frac{-x+4}{2x-3} \qquad x \neq \frac{3}{2}$$

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3

* There are 7 rounds

* You may divide the questions in any way you wish

* Answers go on answer sheet

* Raise your hand when done

* Everyone must participate in every round -

  if you don't "play" - you don't win a prize

* 1st done - 3 points, 2nd - 2, 3rd - 1

  (with correct answers of course)

* Submit 3 wrong answers in a round? You are disqualified for that round!

Review Race

Feb 24-8:01 AM

Functions f, g, and h are given below.

Round 1

$f(x) = x^3$
$f(0) = 0$
$g(x) = f(x) + 1$
$g(f(0)) = 0 + 1$

$f(x) =>$ odd

$g(x) =$ even ... neither

1. Find h(2) $= -20$

2. Find g(f(0)) $= 1$

3. Which statement is true about functions f, g, & h?
   (hint: look at graphs for f & g on your calculator)
   a. f(x) and g(x) are odd, h(x) is even
   b. f(x) and g(x) are even, h(x) is odd
   (c.) f(x) is odd, g(x) is neither, h(x) is even
   d. f(x) is even, g(x) is neither, h(x) is odd

4. Write an equation for k(x), the transformation of f(x) translated right 2 and up 3 $k(x) = (x-2)^3 + 3$
   * see below (from Group work)

5. Find the domain and range for h(x) $D: (-\infty, \infty)$
   $R: [-20, \infty)$

④ from review sheet:
   $r_{x\text{-axis}}$ up 1   : $k(x) = -x^3 + 1$

Dec 1-10:07 AM

Given the function $f(x) = (x - 3)^3 + 1$,

1. find $f^{-1}(x)$. $x = (y-3)^3 + 1$ $y - 3 = \sqrt[3]{x-1}$
   $x - 1 = (y-3)^3$ $y = \sqrt[3]{x-1} + 3$

Round 2

$f^{-1}(x) = \sqrt[3]{x-1} + 3$

2. what is the parent function and what transformation has occurred to produce $f(x)$?

$P(x) = x^3 \rightarrow$ cubic
right 3
up 1

Dec 1-10:08 AM

A   B   C

Round 3

D   E
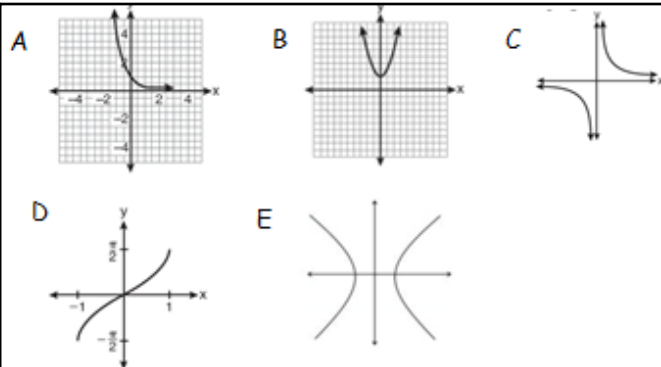
1. Which of the above graphs are not functions?
   E

2. Which of the graphs are 1 – 1 functions?
   A,C,D

3. Which of the graphs are even?
   B, E

4. Which of the graphs are odd?
   C,E,D

5. What is the domain and range for graph D? $D: [-1, 1]$
   $R: \left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

Dec 1-10:08 AM

Given:

$f(x) = x^2 - 2x$, $g(x) = \sqrt{x+1}$, and $k(x) = x - 2$

Round 4

Find each of the following (state any restrictions where they exist):

1. $f(n + 1) = n^2 - 1$

2. $g(f(4)) = 3$

3. $f(g(x)) = x + 1 - 2\sqrt{x+1}$
   $\quad x \geq -1$

4. $\left(\dfrac{f}{k}\right)(x) = x$, $x \neq 2$

5. $(f + k)(x) = x^2 - x - 2$

6. $(f - k)(x) = x^2 - 3x + 2$

① $f(n+1) = (n+1)^2 - 2(n+1)$
$\quad = n^2 + 2n + 1 - 2n - 2$
$\quad = n^2 - 1$

② $g(f(4)) =$
$\quad f(4) = 4^2 - 2(4) = 8$
$\quad g(8) = \sqrt{8+1} = 3$

③ $f(g(x)) = f(\sqrt{x+1})$
$\quad = \left(\sqrt{x+1}\right)^2 - 2\sqrt{x+1}$
$\quad = x + 1 - 2\sqrt{x+1}$

④ $\dfrac{f(x)}{k(x)} = \dfrac{x(x-2)}{x-2} = x$

⑤ $f(x) + k(x) = x^2 - 2x + x - 2$
$\quad = x^2 - x - 2$

⑥ $f(x) - k(x) = x^2 - 2x - x + 2$
$\quad = x^2 - 3x + 2$

Dec 1-10:08 AM

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1. Draw a function that is even
   any graph symmetrical w.r.t. x-axis   **Round 5**
2. Draw a function that is odd
   any graph that looks the same upside down
3. Draw a function that is 1 – 1
   any graph that passes vertical & horizontal line tests
4. Draw a function that is not 1 – 1
   passes vertical not horizontal
5. Draw a relation that is not a function but has an
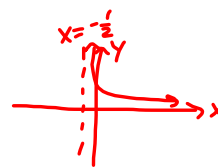   inverse that is a function.
   fails vertical passes horizontal

Dec 1-10:08 AM

For each of the following,
a. State the type of trouble.
b. Find the domain algebraically.
c. Sketch the graph.
d. Use the graph to find the range.

1. $f(x) = \dfrac{2}{\sqrt{2x+1}}$

Double Trouble
$2x+1 > 0$
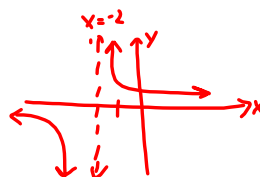D: $\{x \mid x > -\frac{1}{2}\}$ R: $\{y \mid y > 0\}$

$x = -\frac{1}{2}$

2. $g(x) = x^2 + 1$

No Trouble   D: $\{x \mid x \in \mathbb{R}\}$
R: $\{y \mid y \geq 1\}$

3. $h(x) = \sqrt{2x+1}$

Var under $\sqrt{}$
$2x+1 \geq 0$
D: $\{x \mid x \geq -\frac{1}{2}\}$ R: $\{y \mid y \geq 0\}$

4. $j(x) = \dfrac{1}{2x+4}$

var in denominator
$2x+4 = 0$
$x = -2$
D: $\{x \mid x \neq -2\}$ R: $\{y \mid y \neq 0\}$

$x = -2$

Find the inverse algebraically and graphically.

Round 7

$f(x) = 3x - 2$

$x = 3y - 2$
$3y = x + 2$
$y = \dfrac{x+2}{3}$
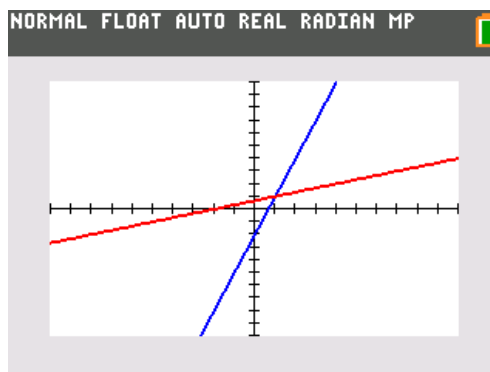$f^{-1}(x) = \dfrac{x+2}{3}$

Graphically

$f(x) \rightarrow$

X	-1	0	1	2
Y	-5	-2	1	4

$f^{-1}(x) \rightarrow$

X	-5	-2	1	4
Y	-1	0	1	2

Switch

NORMAL FLOAT AUTO REAL RADIAN MP

One free multiple
choice answer on
tomorrow's test

Prizes

You may ask one
yes/no question on
tomorrow's test

You will receive
3 bonus points on
tomorrow's test

1st

2nd

Feb 24-8:07 AM

Dec 1-10:06 AM