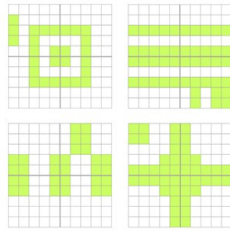Inverse of a Relation (1.4)   *p51*   *day 7*
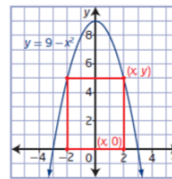
bias toward adding

when is it better to subtract?

training wheels
artwork

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16. A rectangle is inscribed between the x-axis and the parabola $y = 9 - x^2$ with one side along the x-axis, as shown.

p51   *day 7*

14, 16a ✱

a) Write the equation for the area of the rectangle as a function of x.

$A = b\,h$

$= (2x)(y)$

$A(x) = (2x)(9 - x^2)$

14. Two parabolic arches a first arch can be model $y = -x^2 + 9$, with a ra The second arch must distance and be transla left and 3 units down.
a) Sketch the graph of
b) Determine the equa arch.

according to the equation $y = (2x - 8) + 2$. He decides to do the horizontal translation of 8 units to the right first, then the sketch about the y-axis by a factor of $\frac{1}{2}$, and lastly the translation of 2 units up. This gives him Graph 1. To check his work, he decides to apply the horizontal stretch about the y-axis by a factor of $\frac{1}{2}$ first, and then the horizontal translation of 8 units to the right and the vertical translation of 2 units up. This results in Graph 2.
4) Explain why the two graphs are in different locations.
b) How could Gil have rewritten the equation so that the order in which he did the transformations for Graph 2 resulted in the same position as Graph 1?
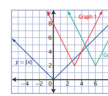
Inverse of a Relation (1.4)   *p51*   *day 7*

Which of the following are invertible?

    closing a door

    putting on your shoes

    ripping paper

    turning on a light

    saying something mean

    burning down the school

Inverse of a Relation (1.4)   *p51*   *day 7*

Many things in life are invertible - you can undo them by doing the opposite action.

In math, we have seen many inverse operations
eq. multiply by 3, divide by 3
    adding 10, subtracting 10

Functions can also be inverted.

An inverse function can be used to undo the original.

Inverse of a Relation (1.4)   *p51*   *day 7*

ex1: Find the inverse of the following:

a) $y = x^2$ b) $y = 4x$ c) $y = x + 5$

$y = \sqrt{x}$ $y = \frac{1}{4}x$ $y = x - 5$

Inverse of a Relation (1.4)   *p51*   *day 7*

ex2: Find the inverse:

$y = x^2 - 4$ $y = 2x + 3$ $y = -5x + 2$

$x = y^2 - 4$ $x = 2y + 3$ $x = -5y + 2$

$x + 4 = y^2$ $x - 3 = 2y$ $x - 2 = -5y$

$\sqrt{x+4} = y$ $\frac{x-3}{2} = y$ $\frac{x-2}{-5} = y$

                                       $-\frac{1}{5}x + \frac{2}{5} = y$

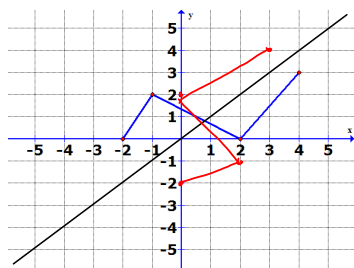*switch x and y and solve for y*   *5abcf*

Inverse of a Relation (1.4)   *p51*   *day 7*

ex3: For the graph of y=f(x), draw the inverse x=f(y).

y=f(x)

x	y
-2	0
-1	2
2	0
4	3

inverse

x	y
0	-2
2	-1
0	2
3	4

switch!

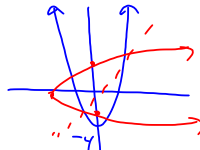notice the graph is a reflection, but not in the x or y axis...

2ab

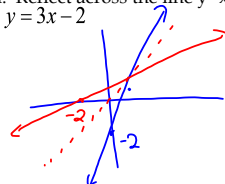## Inverse of a Relation (1.4)   *p51*   *day 7*

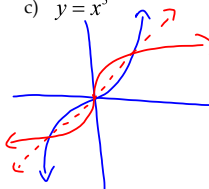ex4: Sketch the inverse of each function. Reflect across the line y=x.

a) $y = x^2 - 4$ b) $y = 3x - 2$

c) $y = x^3$

8ab

Inverse of a Relation (1.4)   *p51*   *day 7*

HW: p51#6, 10a, 13ab