

# Year 2 Pure Chapter 2 - Functions

## Notation

Modulus  $|-5| = |5|$

$f(x) = 2|x| + 3$  or

$f: x \mapsto 2|x| + 3$

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## Mapping

One-to-One = Function

Many-to-One = Function

One-to-Many = **Not** Function

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## Inverse Functions

**Equation  $f^{-1}(x)$**

Take  $f(x)$  and make  $x$  the subject then switch the letters  $x$  and  $y$

**Graphing  $f^{-1}(x)$**

Reflect  $f(x)$  in the line  $y = x$

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## Composite

$gf(x)$

sub  $x$  into  $f(x)$  then take that answer and sub into  $g$

$fg(x)$

sub  $x$  into  $g(x)$  then take that answer and sub into  $f$

## Graphing Modulus

**$y = |f(x)|$**

reflect everything below the  $x$  axis to above the  $x$  axis.

**$y = f(|x|)$**

reflect everything right of  $y$  axis to left of the  $x$  axis.

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## Domain and Range

Range = possible  $y$  values

Domain = possible  $x$  values

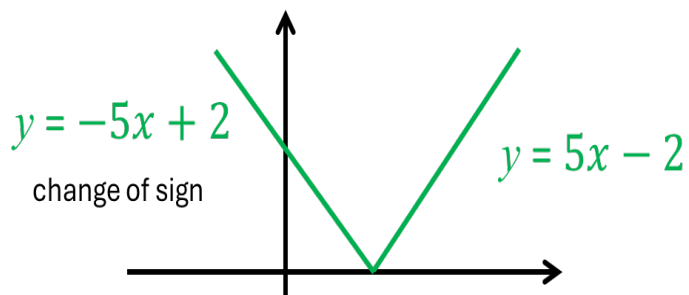
$f(x)$  range =  $f^{-1}(x)$  domain

$f(x)$  domain =  $f^{-1}(x)$  range

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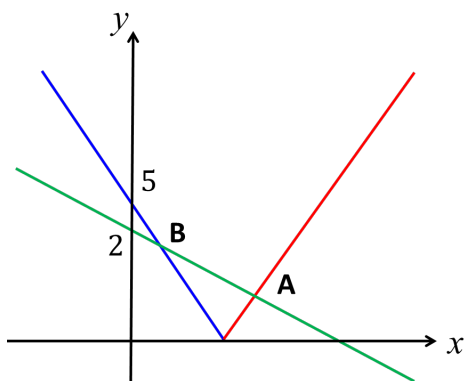
## Graphing

$$y = |5x - 2|$$



## Solving Equations

Solve  $|3x - 5| = 2 - \frac{1}{2}x$



Solve for solution **A**

$$3x - 5 = 2 - \frac{1}{2}x$$

$$\frac{7}{2}x = 7$$

$$x = 2$$

Solve for solution **B**

$$-3x + 5 = 2 - \frac{1}{2}x$$

$$-\frac{5}{2}x = -3$$

$$x = \frac{6}{5}$$

## Transforming Graphs

$f(x + a)$  left

$f(x - a)$  right

$f(x) + a$  up

$f(x) - a$  down

$af(x)$  (x, ay)

$f(ax)$  ( $\frac{x}{a}$ , y)

$-f(x)$  reflect in x axis

$f(-x)$  reflect in y axis

## Multiple

## Transformations

$$y = -3|x + 2| + 4$$

Plot  $|x + 2|$

then transform (x,  $-3y$ )

then transform (x,  $y + 4$ )