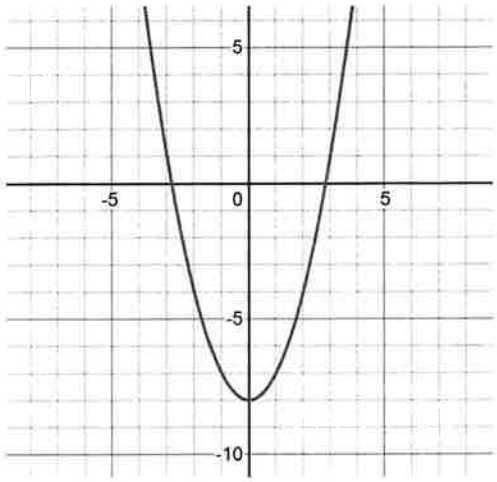
Name: KEY

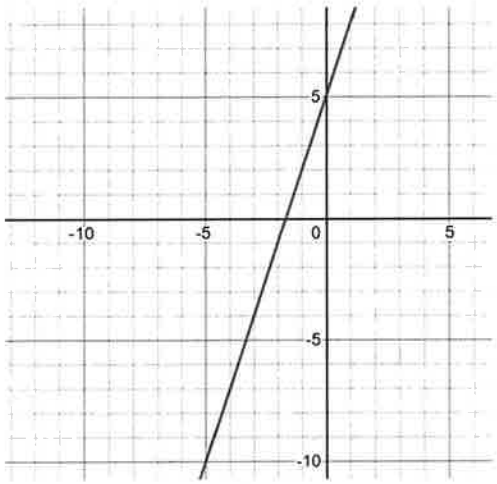
Section 2.1 – Domain and Range/Relations and Functions/Function Notation

Are the following graphs Relations, Functions, or $1-1$ Functions? Explain how you know.



Function

Explain: It passes VLT but not HLT



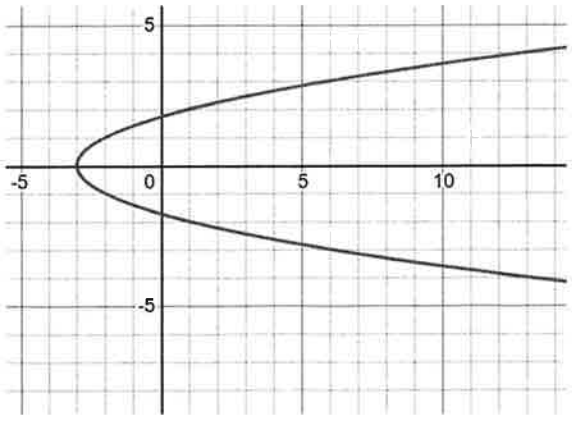
1-1 Function

Explain: VLT and HLT passed

What is the Domain and Range of the following:

Domain: $x \neq -3$

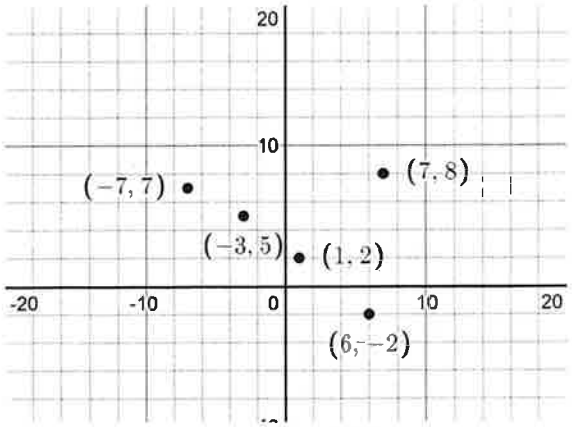
Range: y is All Real Numbers



What is the Domain and Range of the following:

Domain: $\{-7,-3,1,6,7\}$

Range: $\{7,5,2,-2,8\}$



Given the Function:

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

Find:

$f(2) \rightarrow 5(2) - 2 \rightarrow 10 - 2 = \boxed{8}$

$f(-5) \rightarrow 5(-5) - 2 \rightarrow -25 - 2 = \boxed{-27}$

$f(x+7)$ $5(x+7) - 2$

$5x + 35 - 2$

$\boxed{5x + 33}$

Given the Function:

$$f(x) = 3x^2 + 5$$

Find x when $f(x) = 14$

$14 = 3x^2 + 5$

$0 = 3x^2 - 9$

$9 = 3x^2$

$3 = x^2$

$\pm\sqrt{3} = x$

Given: $f(x) = 3x - 2$

Find:

$$f(x+h) - f(x)$$

$f(x+h) = 3(x+h) - 2$

$= 3x + 3h - 2$

$f(x) = 3x - 2$

$f(x+h) - f(x)$

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

$3x + 3h - 2 - 3x + 2$

$\boxed{3h}$

Given: $f(x) = x^2 - 5$

Find:

$$\frac{f(x+h) - f(x)}{h}$$

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

$= (x+h)(x+h) - 5$

$= x^2 + 2xh + h^2 - 5$

$$\frac{x^2 + 2xh + h^2 - 5 - (x^2 - 5)}{h}$$

$$\frac{\cancel{x^2} + 2xh + h^2 \cancel{- 5} \cancel{- x^2 + 5}}{h}$$

$\frac{2xh + h^2}{h} \rightarrow \boxed{2x + h}$