

# 1-1 Notes

①

## Identify relations that are functions

Recall:

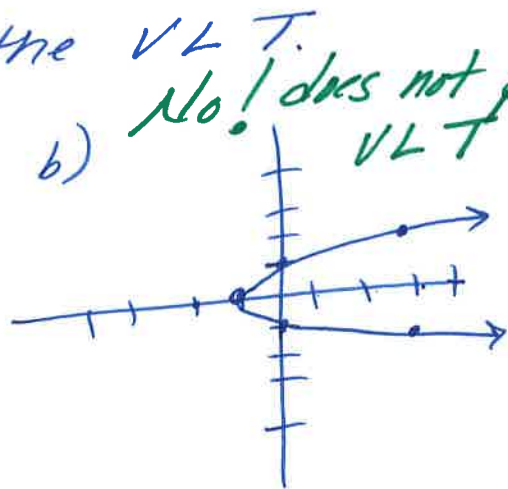
• A function is a relation in which the domain does not repeat.

• The graph passes the VLT.

Function?

a) Yes!

x	y
-8	-5
-5	-4
0	-3
3	-2
6	-3



c)  $y^2 - 2x = 5$  \* isolate  $y$

$$y^2 = 2x + 5$$

$$y = \pm \sqrt{2x + 5}$$

No! each  $x$  will produce 2 corresponding  $y$ -values

proof: let  $x = 2$

$$y = \pm \sqrt{2(2) + 5}$$

$$y = \pm \sqrt{9}$$

$$y = \pm 3$$

$$(2, 3) (2, -3)$$

domain repeats

d)  $y + 7 = x^2$

$$y = x^2 - 7$$

Yes! each  $x$  will produce only 1 corresponding  $y$ -value.

Proof: let  $x = 4$

$$y = (4)^2 - 7$$

$$y = 16 - 7$$

$$y = 9$$

$$(4, 9)$$

domain does not repeat

## Finding Function Values

②

Recall: function notation  $\rightarrow f(x)$  is  $y$

If  $g(x) = x^2 + 8x - 24$ , find  $g(6)$

$$g(6) = 6^2 + 8(6) - 24 \quad * \text{ replace } x \text{ with } 6 \text{ and simplify.}$$

$$g(6) = 36 + 48 - 24$$

$$g(6) = 60 \quad * \text{ this is an ordered pair}$$

$$(6, 60)$$

## Finding $x$ + $y$ intercepts

Recall:  $x$ -int  $\rightarrow$  plug zero in for  $y$   
 $y$ -int  $\rightarrow$  plug zero in for  $x$

Examples:

①  $y = \sqrt{5x - 12}$

$x$ -int  
 $0 = \sqrt{5x - 12}$

$$0 = 5x - 12$$

$$5x = 12$$

$$x = \frac{12}{5}$$

$y$ -int  
 $y = \sqrt{5(0) - 12}$

$$y = \sqrt{-12}$$

$$y = 2i\sqrt{3}$$

$$y\text{-int dne}$$

②  $y = 4x^3 - 32x$

$x$ -int  
 $0 = 4x^3 - 32x$   
 $0 = x(4x^2 - 32)$

$$x = 0 \quad 4x^2 - 32 = 0$$

$$4x^2 = 32$$

$$x^2 = 8$$

$$x = \pm 2\sqrt{2}$$

$y$ -int  
 $y = 4(0)^3 - 32(0)$   
 $y = 0$

$$x = 0, \pm 2\sqrt{2}$$

③  $y = -(x+4)^2 + 8$

x-int

y-int

$$0 = -(x+4)^2 + 8$$

$$y = -(0+4)^2 + 8$$

$$-8 = -(x+4)^2$$

$$y = -16 + 8$$

$$\sqrt{8} = \sqrt{(x+4)^2}$$

$$y = -8$$

$$\pm 2\sqrt{2} = x+4$$

$$x = -4 \pm 2\sqrt{2}$$

Try these!

a)  $3y + 27x = 81$

x-int: 3

y-int: 27

b)  $f(x) = 2x^3 + 14x$

x-int: 0,  $\pm\sqrt{7}$

y-int: 0

c)  $y = (x-5)^2 - 49$

x-int: 2, -12

y-int: -24

d)  $y = \sqrt{3x+17}$

x-int:  $-\frac{17}{3}$

y-int:  $\sqrt{17}$

e)  $y = (x+7)^2 + 9$

x-int: dne

y-int: 58

## 1-1 Homework

Date \_\_\_\_\_ block \_\_\_\_\_

**Evaluate each function.**

1)  $h(x) = x^2 + 5$ ; Find  $h(10)$

$$105$$

2)  $w(x) = 2x$ ; Find  $w(4)$

$$8$$

3)  $h(x) = 2 \cdot 3^{-x}$ ; Find  $h(0)$

$$2$$

4)  $g(n) = 3 \cdot 2^n$ ; Find  $g(-1)$

$$\frac{3}{2}$$

5)  $g(x) = x^2 - 3$ ; Find  $g(5)$

$$22$$

6)  $f(x) = 4x$ ; Find  $f(-3)$

$$-12$$

7)  $g(n) = 3n + 3$ ; Find  $g(-n)$

$$-3n + 3$$

8)  $h(x) = |x| - 1$ ; Find  $h\left(\frac{x}{4}\right)$

$$\left|\frac{1}{4}x\right| - 1$$

9)  $g(a) = 5^{a+3}$ ; Find  $g(n^2)$

$$5^{n^2+3}$$

10)  $w(n) = -n - 5$ ; Find  $w(b^2)$

$$-b^2 - 5$$

11)  $g(x) = x^2 + 2$ ; Find  $g(x+1)$

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

12)  $p(t) = -|t+3|$ ; Find  $p(z+2)$

$$-|z+5|$$

Find the  $x+y$  intercepts

①  $3x + 5y = 15$   $(5, 0)$   $(0, 3)$

②  $y = |x - 1|$   $(1, 0)$   $(0, 1)$

③  $f(x) = 3x^3 - 27x$   $(0, 0)$   $(0, 0)$   
 $(3, 0)$   
 $(-3, 0)$

④  $x - y^2 = 1$   $(1, 0)$   $y\text{-int: dne}$

⑤  $f(x) = x^2 + 4$   $x\text{-int: dne}$   $(0, +4)$

⑥  $f(x) = \sqrt{7x - 5}$   $x\text{-int: } \frac{5}{7}$   $y\text{-int: dne}$

⑦  $f(x) = x^4 - 25$   $(\sqrt{5}, 0)$   $(0, -25)$   
 $(-\sqrt{5}, 0)$