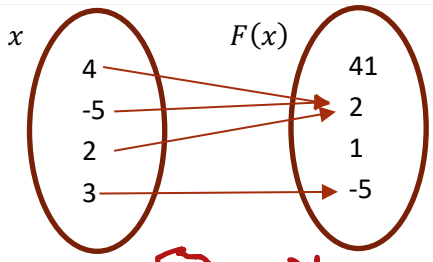
8.1 Absolute Value Graphs

PRACTICE

Determine if the following are functions. For each function, tell what the domain and range is. If it is not a function, explain why.

1.



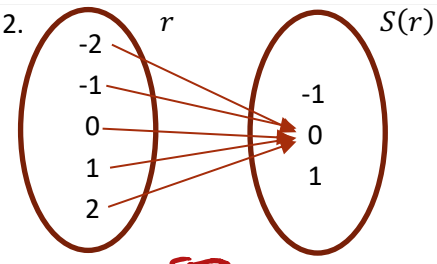
Function? Yes or ~~No~~

Domain: {-5, 2, 3, 4}

Range: {-5, 2}

Find x when $F(x) = 2$ $x = 4, x = -5, x = 2$

2.



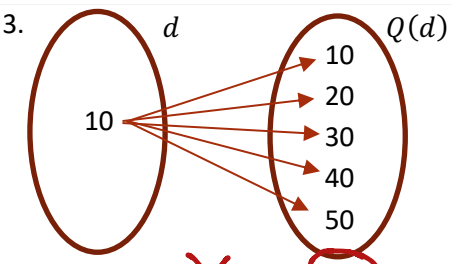
Function? Yes or ~~No~~

Domain: {-2, -1, 0, 1, 2}

Range: {0}

Find r when $S(r) = 0$

3.



Function? ~~Yes~~ or No

Domain: {10}

Range: {10, 20, 30, 40, 50}

4. (3,2), (4, 2), (5, 2), (4, 2), (6, 2)

← same →

Function? Yes or No

Domain: {3, 4, 5, 6}

Range: {2}

5. The assignment of phone numbers (x) to cell phones (y). *

Function? Yes or No

Domain: {phone #'s}

Range: {cell phones}

* Generally, each phone only has one #

6. (-1, -2), (-2, -3) (-3, -4) (-4, -5)

Function? Yes or ~~No~~

Domain: {-1, -2, -3, -4}

Range: {-2, -3, -4, -5}

Find x when $F(x) = -2$ $x = -1$

7. Let the amount of money Bean makes selling b burritos at lunch be defined by $M(b) = 2b - 17$.

a. Complete the following table:

b	0	1	2	3	4	5	33	$(x+2)$
$M(b)$	-17	-15	-13	-11	-9	-7	49	$2x-13$

$2(x+2) - 17$
$= 2x + 4 - 17$
$= 2x - 13$

b. Give a reasonable domain and range for the function in the context of this problem.

Domain: From 0 to 200 burritos is reasonable.

Range: From \$-17 to about \$500 is reasonable.

c. Find $M(-3)$, $M(0.5)$ and $M(20)$. Do any of these not make sense in the context of this problem?

$M(-3) = -23$ } NOT SENSIBLE...

$m(0.5) = -16$ } Can't have negative or decimal burritos

$m(20) = 23$

d. Describe what $M(b) = 33$ would mean for this problem. Then, find b!

8. Solve the following system:

$$2x - 4y = 30$$
$$12 - y = x$$

$2x - 4y = 30$

$12 - x = y$

$2x - 4(12 - x) = 30$

$2x - 48 + 4x = 30$

$6x = 78$

$\boxed{x = 13}$ $\boxed{y = -1}$

9. Solve for y:

$$2x - 4y = 32$$

$\frac{-4y}{-4} = \frac{32}{-4} - \frac{2x}{-4}$

$\boxed{y = -8 + \frac{1}{2}x}$

10. Find the initial value and percent increase for the following model:

$$y = 2.09(1.43)^x$$

I.V. 2.09 % Inc. 43%

Let the functions $A(x) = -\frac{1}{2}x - 5$, $B(x) = 0.25x$ and $C(x) = x^2 - 2x$. Find the following:

#11 #13

11. $A(-2)$ $A(-2) = -\frac{1}{2}x - 5$ $A(-2) = -\frac{1}{2}(-2) - 5$ $A(-2) = -4$	12. $B(-2)$ $B(-2) = 0.25(-2)$ $B(-2) = -0.5$	13. $C(2)$ $C(2) = 2^2 - 2(2)$ $C(2) = 0$	14. $A(-2) - C(2)$ $-11 - 0$ $= -11$
15. Find x if $A(x)$ = -8 $-8 = -\frac{1}{2}x - 5$ $-3 = -\frac{1}{2}x$ $6 = x$	16. Find x if $B(x) = -1.25$ $-1.25 = 0.25x$ $-5 = x$	17. Find x if $A(x)$ = 1 $1 = -\frac{1}{2}x - 5$ $6 = -\frac{1}{2}x$ $-12 = x$	18. $C(n+2)$ $= (n+2)^2 - 2(n+2)$ $= n^2 + 4n + 4 - 2n - 4$ $= n^2 + 2n$
19. $B(-4) - A(6)$ $= -1 - (-8)$ $= -1 + 8$ $= 7$	20. $C(0) + C(0.5)$ $0 + (.5)^2 - 2(.5)$ $0 + 0.25 - 1$ $= -0.75$	21. $B(2) + C\left(\frac{1}{2}\right)$ $0.5 + -0.75$ $= -0.25$	22. Find x if $A(x)$ = 5 $5 = -\frac{1}{2}x - 5$ $10 = -\frac{1}{2}x$ $-20 = x$

8.1 Absolute Value Graphs

WRAP UP

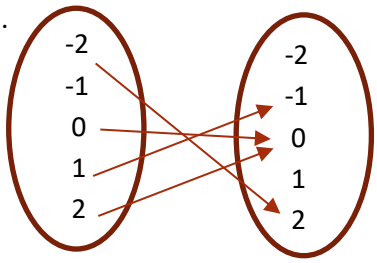
1. (3, 0), (0, 0), (-1, 0), (0, 2)

Is this a Function? Yes or No

Domain:

Range:

2.



Function? Yes or No

Domain:

3. Given $T(x) = 9x - 9$

Find x when $T(x) = -27$

4. The value of, V, of an investment is given by the function $V(t)$, where t is the number of years since 1995 and V is measured in thousands of dollars. Write an equation using function notation that indicates that the investment had a value of four thousand dollars in 2005.