Key

III. Linear Functions

*** Remember that all linear functions have a constant rate of change.*

Function notation

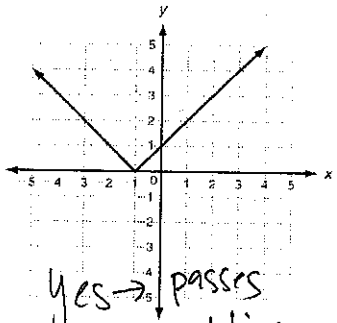
19. Determine if the following is a relation or a function.

a.

x	0	1	2	3	4
y	8	11	14	14	20

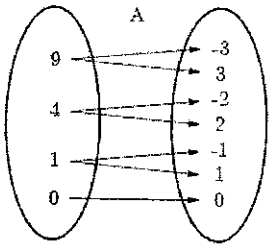
yes, x's don't repeat

b.



yes → passes vertical line test

c.



No! x's go to other ys

20. Rewrite the equation as a function.

$y = 5x - 2$

$f(x) = 5x - 2$

21. Write the coordinate point that this corresponds to.

$f(8) = 0$

(8,0)

Continuous/Discrete

21. Determine if the relations/functions from problem #19 are discrete or continuous.

a. Discrete b. Continuous c. Discrete

Domain/Range and Input/output

22. Identify the domain and range.

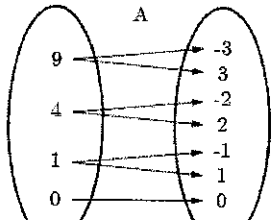
a.

x	0	1	2	3	4
y	8	11	14	17	20

D: {0,1,2,3,4}

R: {8,11,14,17,20}

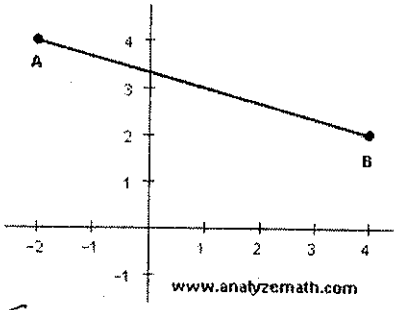
b.



D: {0,1,4,9}

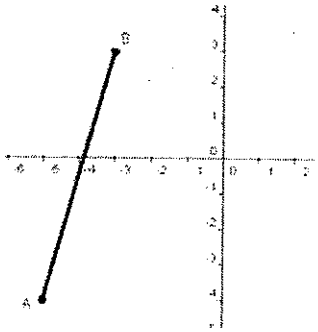
R: {-3,-2,-1,0,1,2,3}

c.



[-2,4]

d.



[-5,-3]

Evaluation functions

23. $h(x) = x^2 - x + 1$ $\quad g(x) = 3x - 6$

a. h(-7)=

$h(-7) = (-7)^2 - (-7) + 1$

$= 49 + 7 + 1$

$= 57$

b. find x, if g(x) = 12

$3x - 6 = 12$

$+6 \quad +6$

$\frac{3x}{3} = \frac{18}{3}$

$x = 6$

24.

x	0	1	2	3	4
f(x)	8	3	0	17	1

a. f (1) = 3

b. find x, if f(x) = 0

$x = 2$

Finding slope- graph, table, 2 points, function

25. Find the slope over the interval [2, 3]

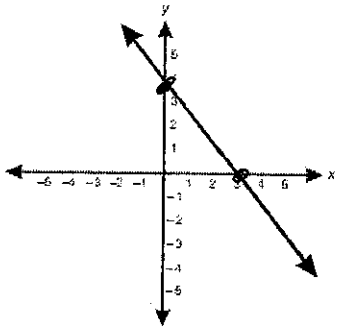
x	0	1	2	3	4
f(x)	8	3	0	17	1

(2, 0) (3, 17)

$x_1\ y_1 \quad x_2\ y_2$

$m = \frac{17 - 0}{3 - 2} = 17$

26. Find the slope over the interval [0, 3]



(0, 4) (3, 0)

$x_1\ y_1 \quad x_2\ y_2$

$m = \frac{0 - 4}{3 - 0} = \frac{-4}{3}$

27. Find the slope over the interval [0, 5] of the function f(x) = 3x + 1

(0, 1) (5, 16)

$x_1\ y_1 \quad x_2\ y_2$

$f(0) = 3(0) + 1 = 1$

$f(5) = 3(5) + 1 = 16$

$m = \frac{16 - 1}{5 - 0} = \frac{15}{5} = 3$

28. Find the slope between the two points (10, 20) and (-4, 5)

$x_1\ y_1 \quad x_2\ y_2$

$m = \frac{5 - 20}{-4 - 10} = \frac{-15}{-14} = \frac{15}{14}$