

"Other Unit"

(Approximately 4 questions on STAAR)

Direct Variation (A2D)

Write and solve equations involving **direct variation**

I can...

- Solve a proportion
- Write a direct variation equation

Setting up and Solving a proportion:

* y always on top *

$$\frac{y}{x} = \frac{y}{x}$$

* CROSS multiply *
& Divide

* make sure that same things are on top & same things on bottom

The value of y varies directly with the value of x . Which function represents the relationship

between x and y if $y = \frac{7}{3}$ when $x = 21$?

A $y = 9x$

B $y = 49x$

C $y = \frac{1}{49}x$

D $y = \frac{1}{9}x$

$$\frac{y}{x} = \frac{7}{21}$$

- 42 In an electrical circuit, the voltage across a resistor is directly proportional to the current running through the resistor. If a current of 12 amps produces 480 volts across a resistor, how many volts would a current of 1.5 amps produce across an identical resistor?

Record your answer and fill in the bubbles on your answer document.

$$\frac{12}{480} = \frac{1.5}{x}$$

60

10 The value of y varies directly with x . If $x = 3$, then $y = 21$. What is the value of x when $y = 105$?

F $\frac{3}{5}$

G $1\frac{2}{3}$

H 7

J 15

Handwritten work for Question 10:

$$\frac{y}{x} = \frac{21}{3} = \frac{105}{x}$$

$$x = 15$$

Labels: y , x , 21 , 3 , 105 , x , 15

The number of cell phones that employees at a factory can assemble is directly proportional to the number of hours the employees spend assembling cell phones. The employees can assemble 1,576 cell phones in 8 hours.

If these employees continue to work at the same rate, how many cell phones will they assemble in 53 hours?

A 12,608

B 10,441

C 83,528

D 70,920

Handwritten work for Question 27:

$$\frac{1,576}{8} = \frac{?}{53}$$

Handwritten work for Question 27:

$$\frac{8}{1576} \times 53$$

27 The value of y is directly proportional to the value of x . If $y = 35$ when $x = 140$, what is the value of y when $x = 70$?

Record your answer and fill in the bubbles on your answer document.

Handwritten work for Question 27:

$$\frac{35}{140} = \frac{y}{70}$$

Handwritten work for Question 27:

$$\frac{35}{140} = \frac{y}{70}$$

Handwritten work for Question 27:

$$\frac{35}{2}$$

Correlation Coefficient (A4A)

Calculate, using technology, the correlation coefficient between two quantitative variables and interpret this quantity as a measure of the strength of the linear association

I can...

- Calculate the correlation coefficient with my calculator
- Interpret the correlation coefficient to determine strong/weak and positive/negative correlation

Notes:

How to Calculate Line of Best Fit:

Put entire table into Lists & Spreadsheets
Go to STATISTICS

How to Calculate Correlation Coefficient:

r^2 underneath equation on calculator

Weak or Strong?

Weak $\rightarrow 0 \rightarrow .6$

Strong $\rightarrow .8 \rightarrow .99$

19 The table shows the heights and the lengths of several rectangles.

Height (in.)	41	70	21	34	10	92	54	24	10	35	42	66
Length (in.)	21	25	32	12	16	45	40	23	45	35	21	14

What does the correlation coefficient for the data indicate about the strength of the linear association between the height and the length of these rectangles?

- A Weak negative correlation
- B Strong negative correlation
- C Weak positive correlation
- D Strong positive correlation

$r^2 = .02$ \leftarrow positive #
Weak

Association vs. Causation (A4B)

Compare and contrast **association** and **causation** in real-world problems

I can...

- Describe and give examples of association
- Describe and give examples of causation

Notes:

Definition of Association: related, but one does not cause the other to happen

Definition of Causation: one causes the other to happen

25 Which situation does **NOT** show causation?

- A When the student population at a school increases, the number of teachers at the school increases.
- B When the amount of sugar in a quart of apple juice is reduced, there are fewer calories in each serving.
- C When there are more workers on a project, the project is completed in less time.
- D When there is more protein in an athlete's diet, the athlete scores more points in a game.

9 Which situation best represents causation?

- A When the number of bus stops increases, the number of car sales decreases.
- B When fewer firefighters report to a house fire, the damage caused by the fire decreases.
- C When ice cream sales increase, incidents of sunburn increase.
- D When it rains several inches, the water level of a lake increases.

5. Which of the following shows a relationship that is associated but not causal?

- A. The amount of rainfall received and level of water in the lake.
- B. The number of lights left on each day and the amount of the electric bill.
- C. The increase of warm, sunny days and the number of ice cream vendors visible.
- D. The number of hours worked and how much money is made.

Definition of a Function (A12A)

Decide whether **relations** represented verbally, tabularly, graphically, and symbolically **define a function**

I can...

- Determine if a graph represents a function using the vertical line test
- Determine if a set of points, table, or mapping represent a function
- Define a function

Notes:

Definition of a function: \neq every x has only one y
 \neq x 's cannot repeat

Rule for a GRAPH:

vertical line test

- ① Draw vertical line \updownarrow
- ② If it crosses graph once \rightarrow is a function

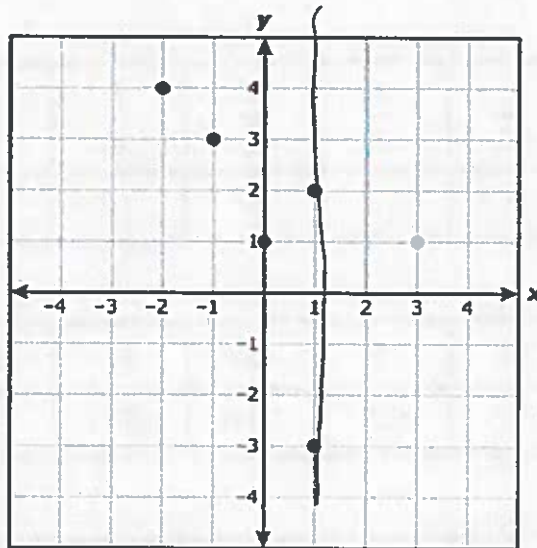
Rule for a TABLE/SET OF POINTS/MAPPING:

LOOK at x 's, They cannot repeat

more than once \rightarrow not a function

Sample Questions

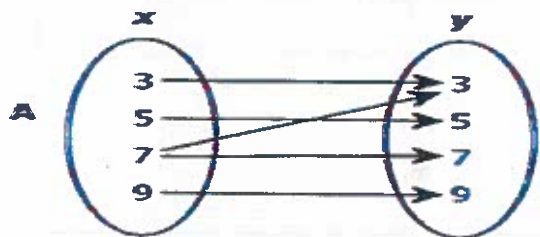
The graph of a relation is shown on the grid.



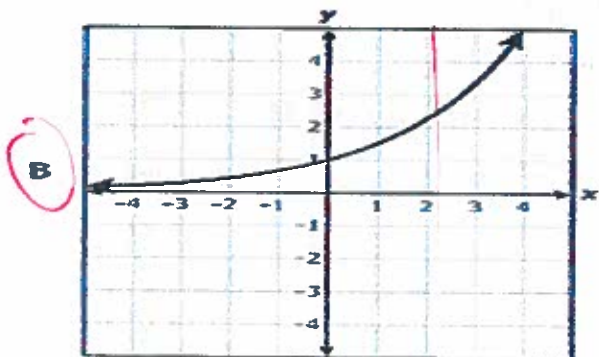
Which statement is true?

- A The graph does not represent y as a function of x , because more than one point has an x -coordinate of 1.
- B The graph represents y as a function of x , because only one point has a y -coordinate of 2.
- C The graph does not represent y as a function of x , because more than one point has a y -coordinate of 1.
- D The graph represents y as a function of x , because only one point has an x -coordinate of 2.

Which representation shows y as a function of x ?



C $x + 8 = 0$



D

x	4	4	4	4
y	-7	0	9	13

38 Which table does NOT show y as a function of x ?

F

x	$\frac{1}{10}$	$\frac{1}{8}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{1}{2}$
y	9	11	9	14	7

G

x	14	15	16	17	18
y	100	80	110	100	90

H

x	-0.2	0.6	-1.3	1.0	-0.2
y	5.8	-3.7	4.4	-0.9	8.1

J

x	-24	21	24	-27	29
y	2.7	2.8	2.7	2.5	2.5

19 Which set of ordered pairs represents y as a function of x ?

A $\{(-9, 2), (0, 6), (1, -2), (-3, 6)\}$ ✓

B $\{(-1, 0), (4, 3), (-7, -3), (-1, -8)\}$

C $\{(3, 2), (-4, -2), (3, 1), (-4, 1)\}$

D $\{(5, 4), (2, 3), (1, 1), (2, 4)\}$

36 Which table represents y as a function of x ?

F

x	y
-5	-5
3	-2
-5	5
-3	-2

H

x	y
-3	-4
1	4
-3	4
1	-4

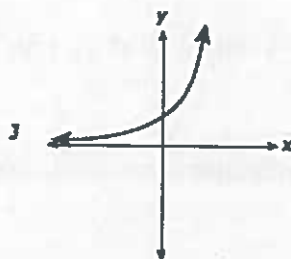
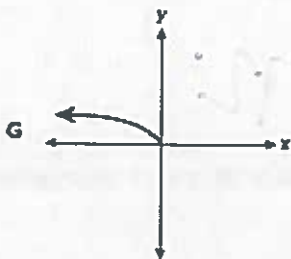
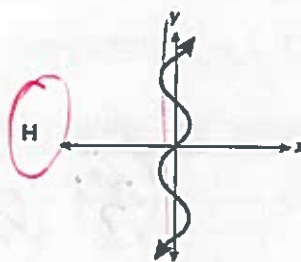
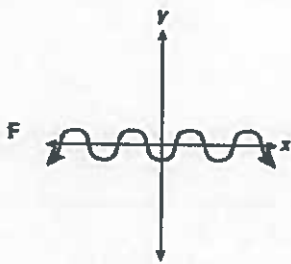
G

x	y
6	-6
-6	6
8	-8
-8	8

J

x	y
2	-1
2	-2
2	-3
2	-4

Which graph does not represent y as a function of x ?



Function Notation (A12B)

Evaluate functions, expressed in function notation, given one or more elements in their domains

I can...

- Given a value for x , determine the value of the function

Notes:

- ① put equation into graph
- ② Go to Table. Look for # that is in () in the 1st column.

Sample Questions

47 If $p(x) = 5(x^2 + 1) + 16$, what is the value of $p(11)$?

A 690

B 736

C 622

D 626

20 Given $f(x) = \frac{1}{3}(4 - x)^2$, what is the value of $f(16)$?

Record your answer and fill in the bubbles on your answer document.

48

27 Given $f(x) = 6(1 - x)$, what is the value of $f(-8)$?

Record your answer and fill in the bubbles on your answer document.

~~54~~ 54

42 If $f(x) = \frac{2}{3}x^2 + 8x$, what is the value of $f(6)$?

72

Record your answer and fill in the bubbles on your answer document.

Identify Arithmetic and Geometric Sequences (A12C)

Identify terms of arithmetic and geometric sequences when the sequences are given in function form using recursive processes

I can...

Sample Questions

(1) Put equations into Graph

(2) Go to Table. LOOK for # that is next to n in 1st

Given the explicit formula for an arithmetic sequence find the first five terms and the term named in the problem (dumr)

7) $a_n = -11 + 7n$

Find a_{34}

a_{34}

227

8) $a_n = 65 - 100n$

Find a_{39}

-3835

9) $a_n = -7.1 - 2.1n$

Find a_{27}

-63.8

10) $a_n = \frac{11}{8} + \frac{1}{2}n$

Find a_{23}

~~15000~~
12.875

Given the explicit formula for a geometric sequence find the first five terms and the 8th term.

7) $a_n = 3^{n-1}$

{1, 3, 9, 27, 81}

$a_8 = 2187$

8) $a_n = 2 \cdot \left(\frac{1}{4}\right)^{n-1}$

{2, .5, .125, .03125, .0078125}

$a_8 = .000122$

9) $a_n = -2.5 \cdot 4^{n-1}$

{-2.5, -10, -40, -160, -640}

$a_8 = -40960$

10) $a_n = -4 \cdot 3^{n-1}$

{-4, -12, -36, -108, -324}

$a_8 = -8748$

Write Arithmetic and Geometric Sequences (A12D)

Write a formula for the n th term of arithmetic and geometric sequences, given the value of several of their terms

I can...

Sample Questions

23 The first five terms in a pattern are shown below.

$-0.5, -0.25, 0, 0.25, 0.5, \dots$

If the pattern continues, which expression can be used to find the n th term?

A $0.75n - 1.25$

B $-0.25n - 0.25$

C $0.25n - 0.75$

D $-0.5n + 0.25$

The first five terms in a pattern of numbers are shown.

$2.4, -3.4, -9.2, -15, -20.8, \dots$

If the pattern continues, which expression can be used to find the n^{th} term?

A $-5.8 - 3n$

B $-3 - 5.8n$

C $8.2 - 5.8n$

D $-5.8 - 8.2n$

13 A pattern of dots is shown in the four figures below.



If the pattern continues, which expression can be used to find the total number of dots in Figure n ?

A $3n - 5$

B $2n + 2$

C $2n + 3$

D $3n - 1$

