

Algebra 1 SOL Released Questions:

Variations

An experiment is conducted on a container of gas that is kept at a constant temperature.

- When the pressure on the gas is 30 pounds per square inch, the volume is 120 cubic inches.
- When the pressure on the gas is 40 pounds per square inch, the volume is 90 cubic inches.
- Let p represent the pressure on the gas.
- Let v represent the volume of the gas.

Which statement is true about this relationship?

- A The volume of the gas varies directly with the pressure because $v = 4p$.
- B The volume of the gas varies directly with the pressure because $vp = 3,600$.
- C The volume of the gas varies inversely with the pressure because $v = 4p$.
- D The volume of the gas varies inversely with the pressure because $vp = 3,600$.

FIG 2009

Directions: Click on the grid to plot two points. The coordinates of the points must be integers.

Point A is an element of a direct variation. Plot two points, other than A , that are also elements of this direct variation.

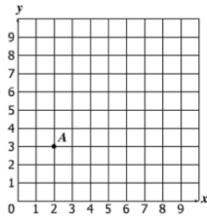


FIG 2009

A relation is shown in this table.

x	y
1	10.00
4	2.50
8	1.25
20	0.50

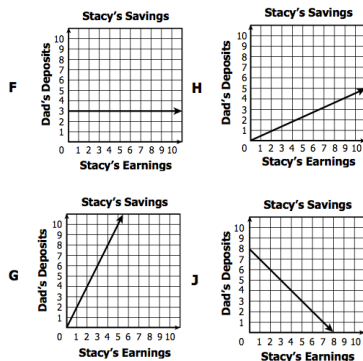
Which statement about this relation is true?

- A It is a direct variation because $y = -2.5x + 12.5$
- B It is an inverse variation because $y = -2.5x + 12.5$
- C It is a direct variation because $10 = xy$
- D It is an inverse variation because $10 = xy$

FIG 2009

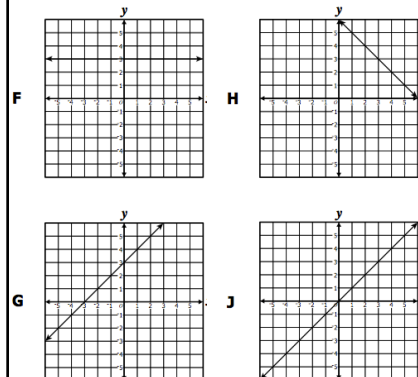
For every dollar that Stacy earns, her dad deposits twice that amount into a savings account for her.

Which graph illustrates this example of direct variation?



2010

Which graph *best* represents a direct variation?



2010

Which of the following tables indicates that x and y vary directly?

F

x	y
1	2
2	4
3	4
4	5
5	8

H

x	y
1	5
2	4
3	3
4	4
5	5

G

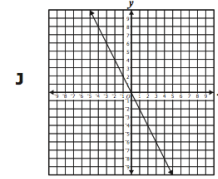
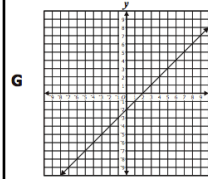
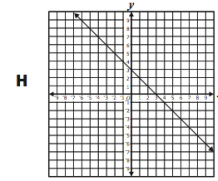
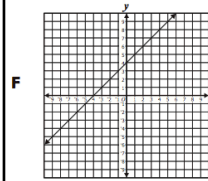
x	y
1	1
2	4
3	9
4	16
5	25

J

x	y
1	3
2	6
3	9
4	12
5	15

2010

Which of the following graphs shows a direct variation?



2009

The number of miles, m , a car can travel varies directly with the amount of gas, g , in its fuel tank. If k is the constant of variation, which equation represents that situation?

F $m = \frac{k}{g}$

G $m = \frac{g}{k}$

H $m = kg$

J $m = g + k$

2009

The relationship shown in the table is a direct variation.

x	y
5	15
6	18
7	21
8	24

Which equation *best* represents this relationship?

A $y = 4x - 5$

B $y = x + 10$

C $y = 3x$

D $y = \frac{1}{3}x$

2009

In which table does y *not* vary directly as x ?

F

x	-2	-1	0	1
y	-10	-5	0	5

G

x	1	2	3	4
y	10	20	30	40

H

x	0	1	2	3
y	0	3	6	9

J

x	-2	-1	1	2
y	-1	-2	2	1

2008

The number of water bottles used during a team's football practice varies directly with the temperature. If a team uses 75 bottles when the temperature is 60° , what is the temperature if they use 120 bottles?

F 96°

G 92°

H 84°

J 80°

2008

The depth of a lake, d , varies directly with r , the amount of rainfall last month. If k is the constant of variation, which equation represents the situation?

A $d = \frac{r}{k}$
 B $d = \frac{k}{r}$
 C $d = k + r$
 D $d = kr$

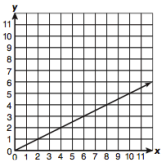
2008

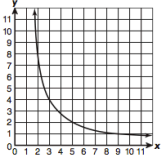
For a group of objects made of the same material, the weight of an object varies directly with its volume. If an object that has a volume of 20 cubic inches weighs 28 ounces, what is the constant of variation?

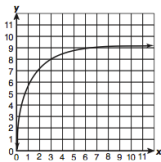
A $\frac{5}{7}$
 B $\frac{7}{5}$
 C 20
 D 28

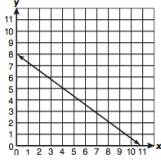
2007

Which graph shows that y varies directly as x ?

A 

B 

C 

D 

2007

Distance, d , varies directly as time, t , when speed remains constant. If d is 240 miles when t is 8 hours, what is the constant speed?

F 1,920 miles per hour
 G 232 miles per hour
 H 30 miles per hour
 J $\frac{1}{30}$ mile per hour

2007

If y varies directly as x , what is the equation for the direct variation shown in the table below?

x	-2	-1	0	1	2
y	-14	-7	0	7	14

A $y = \frac{1}{7}x$
 B $y = 7x$
 C $y = \frac{7}{x}$
 D $7y = x$

2008

Which of these equations is a direct variation?

F $y = -8$
 G $y = -8x$
 H $y = -8x + 1$
 J $y = -8x - 1$

2008

The cost of fabric varies directly with the amount of fabric purchased. If

$1\frac{2}{3}$ yards of fabric cost \$10.00, how much would $4\frac{1}{2}$ yards cost?

- F \$45
- G \$27
- H \$24
- J \$14

2008

If m varies directly as p , and $m = 5$ when $p = 7$, what is the constant of variation?

- A 35
- B 12
- C $\frac{7}{5}$
- D $\frac{5}{7}$

2008

Trina's paycheck earnings, p , varies directly as the number of hours, h , she works. If she works 19 hours and earns \$187.15, what should she earn if she worked 40 hours?

- A \$394.00
- B \$443.25
- C \$472.80
- D \$512.20

2005

In the table, y varies directly with x .

x	10	15	20	25
y	6	9	12	15

Which equation best describes the data?

- F $xy = \frac{5}{3}$
- G $xy = \frac{3}{5}$
- H $y = \frac{5}{3}x$
- J $y = \frac{3}{5}x$

2005

The number of words Maria typed varied directly with the amount of time she spent typing. If she typed 275 words in 5 minutes, how long would it take her to type 1,100 words?

- A 220 minutes
- B 20 minutes
- C 15 minutes
- D 4 minutes

2004

If y varies directly as x and the constant of variation is -2 , which equation represents this relationship?

- A $y = -2x$
- B $y = -\frac{2}{x}$
- C $y = \frac{x}{-2}$
- D $y = 2x$

2004

x	y
1	\$0.05
2	\$0.10
3	\$0.15
4	\$0.20
5	\$0.25

Which is an equation for the variation that includes all the data in the table?

- F $xy = 0.05$
- G $y = x + 0.05$
- H $y = 0.05x$
- J $y = \frac{x}{0.05}$

2004

The gas pressure in a chamber varies directly with the temperature in the chamber. If the pressure in the chamber is 150 atmospheres (atm) when the chamber is at 50°F, what is the pressure in the chamber when the temperature of the chamber is 75°F?

- F 175 atm
- G 200 atm
- H 225 atm
- J 275 atm

2003

If a varies directly as b and $a = 3$ when $b = 12$, what is the value of a when $b = 18$?

- A 0.25
- B 4
- C 4.5
- D 72

2002

In which table of ordered pairs does n vary directly as m ?

F

m	n
-2	-1
-1	-2
1	2

G

m	n
-2	4
-1	2
1	-2

H

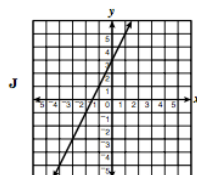
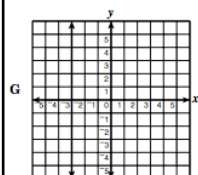
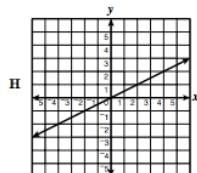
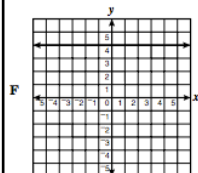
m	n
-2	-2.5
-1	-5.0
1	5.0

J

m	n
-2	-2
-1	-4
1	4

2002

In which graph is y a direct variation of x ?



2001

Which equation represents an inverse variation?

- A $\frac{a}{4} = \frac{b}{9}$
- B $\frac{a}{5} = \frac{2}{b}$
- C $2a + 3 = 4b + 3$
- D $\frac{a}{b} = 7$

2001

a varies directly as b and the constant of variation is $\frac{1}{4}$. Which equation represents the relationship?

F $a = \frac{1}{4}b$

G $a = 4b$

H $a = b + \frac{1}{4}$

J $a = b - \frac{1}{4}$

2000

a varies directly as b and $a = 12$ when $b = 4$. What is the constant of variation?

A -8

B $\frac{1}{3}$

C 3

D 8

2000