

LESSON

Problem Solving**12-5****Direct Variation**

Determine whether the data sets show direct variation. If so, find the equation of direct variation.

1. The table shows the distance in feet traveled by a falling object in certain times.

Time (s)	0	0.5	1	1.5	2	2.5	3
Distance (ft)	0	4	16	36	64	100	144

2. The R-value of insulation gives the material's resistance to heat flow. The table shows the R-value for different thicknesses of fiberglass insulation.

Thickness (in)	1	2	3	4	5	6
R-value	3.14	6.28	9.42	12.56	15.7	18.84

3. The table shows the lifting power of hot air.

Hot Air (ft ³)	50	100	500	1000	2000	3000
Lift (lb)	1	2	10	20	40	60

4. The table shows the relationship between degrees Celsius and degrees Fahrenheit.

° Celsius	-10	-5	0	5	10	20	30
° Fahrenheit	14	23	32	41	50	68	86

The relationship between your weight on Earth and your weight on other planets is direct variation. The table below shows how much a person who weighs 100 lb on Earth would weigh on the moon and different planets.

5. Find the equation of direct variation for the weight on earth e and on the moon m .

A $m = 0.166e$

C $m = 6.02e$

B $m = 16.6e$

D $m = 1660e$

6. How much would a 150 lb person weigh on Jupiter?

F 63.5 lb

H 354.6 lb

G 286.4 lb

J 483.7 lb

Solar System Objects	Weight (lb)
Moon	16.6
Jupiter	236.4
Pluto	6.7

7. How much would a 150 lb person weigh on Pluto?

A 5.8 lb

C 12.3 lb

B 10.05 lb

D 2238.8 lb

LESSON Problem Solving

12-5 Direct Variation

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No direct variation

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R-value	3.14	6.28	9.42	12.56	15.7	18.84

Direct variation; $R = 3.14t$

3. The table shows the lifting power of hot air.

Hot Air (ft ³)	50	100	500	1000	2000	3000
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Direct variation; $L = \left(\frac{1}{50}\right)H$

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No direct variation

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LESSON Reading Strategies

12-5 Use Tables and Graphs

When quantities are related proportionally by a constant multiplier, they have **direct variation**.

This table shows the relationship between the number of glasses filled and the amount of juice needed to fill them. The amount of juice needed *varies directly* with the number of glasses filled.

Glasses	1	2	3	4
Juice Needed	8 oz	16 oz	24 oz	32 oz

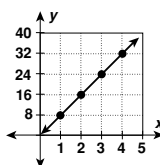
1. What are the quantities that form this direct variation?

number of glasses filled and ounces of juice needed

2. What is the constant multiplier?

8

A graph of a direct variation is always linear and always passes through (0,0).



3. What do the x-values on the graph stand for?

the number of glasses filled

4. What do the y-values on the graph stand for?

the amount of juice needed for each glass

5. What does the ordered pair (2, 16) mean?

2 glasses need 16 ounces of juice

6. Write an ordered pair for 3 glasses and the amount of juice needed.

(3, 24)

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LESSON Puzzles, Twisters & Teasers

12-5 It Just Doesn't Hold Water!

Circle words from the list in the word search (horizontally, vertically or diagonally). You will also find a word that answers the riddle.

direct variation constant proportionality ratio
graph quantity algebra table data

PROPORTIONALITY
VACVBNAIKLLQWER
ATDFGHBUIJMGGRAPH
RIERTYLTHNEQTYU
IOBGHUEWDVBUIOP
AASDFGHJKLRAASD
TSIEVEXDATA NFGH
IZXCVBNMKIJTKLQ
ODIRECTHUJIIIZXC
NCONSTANTDFTVBN
LKJHGFDSATBYMKI

What is as round as a dishpan and as deep as a tub, yet the ocean could not fill it?

A sieve



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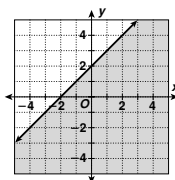
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LESSON Practice A

12-6 Graphing Inequalities in Two Variables

1. The graph shows $y = x + 2$. Shade the inequality $y \leq x + 2$.



Solve each inequality for y .

3. $x + y \geq 8$

$y \geq -x + 8$

4. $3x - y > 6$

$y < 3x - 6$

5. $x - y \geq -2$

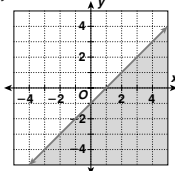
$y \leq x + 2$

6. $4x + y \leq -3$

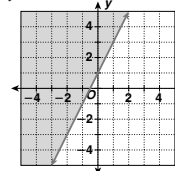
$y \leq -4x - 3$

Graph each inequality.

7. $y \leq x - 1$

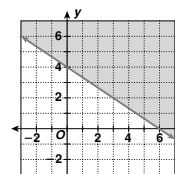


8. $y \geq 2x + 1$



9. Georgia has scored at least 12 points in each of her basketball games this year. She has scored both 2-point and 3-point field goals in every game. Let x equal the 2-point shots and y equal the 3-point shots. Write and graph an inequality to show the number of points she scored each game.

$2x + 3y \geq 12$, or $y \geq -\frac{2}{3}x + 4$



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