

Algebra I 3.4  
Solve and graph direct variation equations  
Use direct variation in context

direct variation  
COV  $k$   
directly proportional

$y = k \cdot x$

whiteboards

Oct 16-3:50 PM

Suppose  $y$  varies directly as  $x$ . Write a direct variation equation that relates  $x$  and  $y$ . Then solve.

$y = k \cdot x$

7. If  $y = 15$  when  $x = 12$ , find  $y$  when  $x = 32$ .  
 $15 = k \cdot 12$   
 $\frac{15}{12} = \frac{k \cdot 12}{12}$

8. If  $y = -11$  when  $x = 6$ , find  $x$  when  $y = 44$ .  
 $\frac{5}{4} = k$

$y = \frac{5}{4} \cdot x$

1. find  $(x, y)$   
 2. use to find  $k$   
 3. write eq  
 4. ans.?

$y = \frac{5}{4} \cdot \frac{32}{1}$   
 $y = 40$

$y = -\frac{11}{6} \cdot x$   
 $\frac{6}{7} \cdot \frac{44}{4} = \frac{11}{6} \cdot x \cdot \frac{6}{7}$   
 $24 = x$

$y = k \cdot x$   
 $-11 = k \cdot 6$   
 $\frac{-11 \cdot 6}{6} = \frac{k \cdot 6}{6}$   
 $k = -\frac{11}{6}$

Oct 16-4:49 PM

Real-World Example 4 Estimate Using Direct Variation

TRAVEL The distance a jet travels varies directly as the number of hours it flies. A jet traveled 3420 miles in 6 hours.

What is this problem about?

$y = k \cdot x$   
 $d = k \cdot t$

a. Write a direct variation equation for the distance  $d$  flown in time  $t$ .  
 $d = 570t$

b. Graph the equation.  
 $6500 = 570t$   
 $3420 = k \cdot 6$   
 $k = 570 \frac{\text{mi}}{\text{hr}}$

c. Estimate how many hours it will take for an airplane to fly 6500 miles.

$t \approx 11.4 \text{ hrs.}$

0	0
1	570
2	1140
3	1710
4	2280
?	6500

Oct 16-4:49 PM

4. HOT-AIR BALLOONS A hot-air balloon's height varies directly as the balloon's ascent time in minutes.

What is this problem about?

$h = k \cdot t$

$350 = k \cdot 5$   
 $70 = k$

$h = 70t$  (prac)  
 WR 3.4

$y = mx + B$   
 $y = 2x + 0$

Oct 16-4:50 PM

9. REASONING You find that the number of messages you receive on your message board varies directly as the number of messages you post. When you post 5 messages, you receive 12 messages in return.

Your equation should reflect what the problem is about.

Find the number of messages you need to post to receive 96 messages.

Oct 16-4:51 PM

$y = kx$

Oct 16-4:44 PM