

Algebra 1 3.4

Solve and graph direct variation equations

Use direct variation in context

direct variation

COV = m

$$y = k \cdot x$$

* directly proportional
whiteboards

Whiteboards

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

$$\frac{15}{12} = \frac{k \cdot 12}{12} \quad k = \frac{5}{4}$$

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

$$(12, 15)$$

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

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

$$y = 40$$

7. If $y = 15$ when $x = 12$, find y when $x = 32$.

8. If $y = -11$ when $x = 6$, find x when $y = 44$.

$$(6, -11)$$

$$y = k \cdot x$$

$$k = \frac{-11}{6}$$

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

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

$$\frac{-6}{11} \cdot 44 = \frac{-11}{6} \cdot x \cdot \frac{-6}{11}$$

$$-24 = x$$

$$y = -1.833 \cdot x$$

$$44 = -1.833x$$

$$D = R \cdot T$$

$$D = K \cdot T$$

$$D = 570 \cdot T$$

What is this problem about?

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.

$$y = k \cdot x$$

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

b. Graph the equation.

$$\frac{3420}{6} = \frac{k \cdot 6}{6}$$

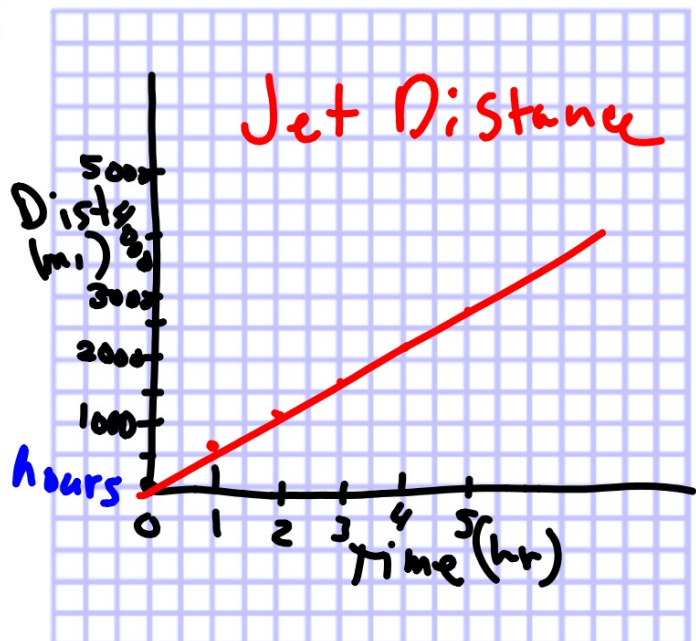
c. Estimate how many hours it will take for an airliner to fly 6500 miles

$$\frac{3420}{6} = k$$

$$d = 570t$$

$$\frac{6500}{570} = \frac{570t}{570}$$

≈ 11.4 hours



$$h = k \cdot t$$

What is this problem about?

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

$$\frac{350}{5} = \frac{k \cdot 5}{5}$$

$$k = 70$$

$$h = 70t$$



$$(x, y) \rightarrow (p, r) \quad (5, 12)$$

9. **CCSS 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.

$$r = k \cdot p$$

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

$$\frac{12}{5} = \frac{k \cdot 5}{5}$$

$$\frac{12}{5} = k$$

$$r = 2.4 \cdot p$$

$$\frac{96}{2.4} = \frac{2.4 \cdot p}{2.4}$$

Your equation should reflect what the problem is about.

$$p = 40$$

WB 3.4 prac.
(1-12)