② $y = 2x$

Algebra 1 3.4

Solve and graph direct variation equations

Use direct variation in context

direct variation ↑ ↑ ③ question

① COV

directly proportional

whiteboards

Whiteboards

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

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

$(12, 15)$ $y = \frac{5}{4} \cdot x$ $y = \frac{5}{4} \cdot 32 = 40$

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

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

$d = k \cdot t$ $\quad \frac{3420}{6} = \frac{k \cdot 6}{6}$ $\quad k = 570$

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.

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

$d = 570t$

b. Graph the equation.

$y = 570x$

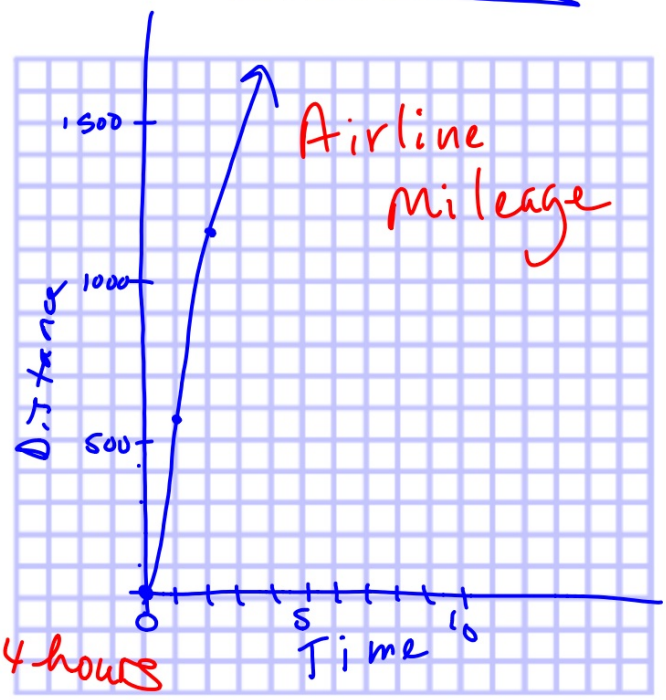
c. Estimate how many hours it will take for an airliner to fly 6500 miles.

$d = 570t$

$d = 570t + 0$

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

$11.4 = t$ $\quad t \approx 11.4$ hours

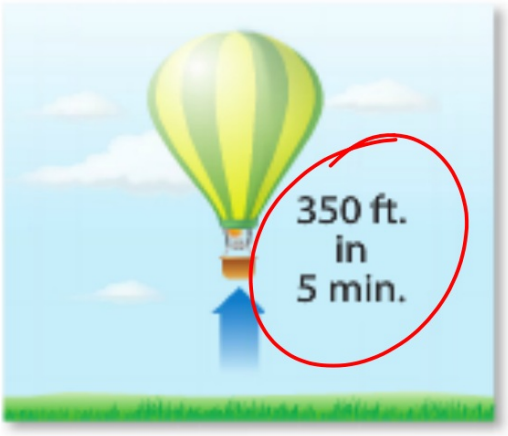


$y = kx$

$h = kt$

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.



$R = kP$

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.

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

Your equation should reflect what the problem is about.