

For each problem, write a proportion and an equation in the form $y = kx$. Answer each question and state the constant of variation for the problem.

1. Heather weekly pay is directly proportional to the number of hours she works at the record store. Her pay is \$174 for 24 hours of work. Find the amount of pay for 40 hours of work.

Proportion: $\frac{\$174}{24 \text{ hrs}} = \frac{\$x}{40 \text{ hrs}}$ $24x = 6960$ $x = 290$	$y = kx$: $174 = k(24)$ $7.25 = k$ $y = 7.25x$
Constant of Variation: $\$7.25$	Answer: $\$290$

2. Eduardo counted 10 seconds between seeing lightning and hearing thunder, and he knew that the lightning was about 2 miles away. If he counted 4 seconds between the next flash of lightning and thunder, how far away was the lightning?

Proportion: $\frac{10 \text{ seconds}}{2 \text{ miles}} = \frac{4 \text{ seconds}}{x \text{ miles}}$ $10x = 8$ $x = \frac{4}{5}$	$y = kx$: $10 = k(2)$ $5 = k$ $y = 5x$
Constant of Variation: 5 seconds	Answer: $\frac{4}{5} \text{ mile}$

3. At top speed, a rabbit can cover 7 miles in 12 minutes. IF a rabbit could continue at this rate indefinitely, how long would it take the rabbit to cross the 220-mile expanse of the Mojave Desert?

Proportion: $\frac{12 \text{ min}}{7 \text{ miles}} = \frac{x \text{ min}}{220 \text{ miles}}$ $7x = 2640$ $x = 377\frac{1}{7}$	$y = kx:$ $12 = k(7)$ $1\frac{5}{7} = k$ $y = 1\frac{5}{7}x$
Constant of Variation: $1\frac{5}{7}$	Answer: $377\frac{1}{7} \text{ minutes}$ (6 hours 17 mins)

3. A dishwasher uses 65 gallons of water to wash 5 loads of dishes. How many gallons of water would be used to wash 12 loads?

Proportion: $\frac{65 \text{ gallons}}{5 \text{ loads}} = \frac{x \text{ gallons}}{12 \text{ loads}}$ $5x = 780$ $x = 156$	$y = kx:$ $65 = k(5)$ $13 = k$ $y = 13x$
Constant of Variation: 13 gallons	Answer: 156 gallons

4. A person's weekly pay is directly proportional to the number of hours worked. Shawn's pay is \$123.00 for 20 hours of work. Find the amount of pay for 31 hours of work.

Proportion: $\frac{\$123}{20 \text{ hrs}} = \frac{\$x}{31 \text{ hrs}}$ $20x = 3813$ $x = 190.65$	$y = kx:$ $123 = k(20)$ $6.15 = k$ $y = 6.15x$
Constant of Variation: $\$6.15$	Answer: $\$190.65$