

Direct Variation

Solve using proportions.

1) If 7 cans of dog food sell for \$4.13, how much will 10 cans of dog food sell for?

Known fact 7 cans sell for \$4.13

Unknown fact 10 cans sell for x dollars

Estimation: 14 cans will sell for \$8.26, so 10 cans is between \$4.13 and \$8.26

$$\frac{7}{10} = \frac{4.13}{x}$$

$$7x = 41.3$$

$$x = 5.9$$

10 cans sell for \$5.90

2) If 6 cans of coffee sell for \$22.24, how much will 20 cans sell for?

Known fact 6 cans sell for \$22.24

Unknown 20 cans sell for x dollars

Estimation: 6 cans is close to \$20
18 cans is close to \$66.00
20 cans is around \$66.00

$$\frac{6}{20} = \frac{22.24}{x}$$

$$6x = 444.8$$

$$x = 74.13$$

20 cans sell for \$74.13

3) A mechanic took 7 hrs to tune up 9 fuel-injected engines. At this rate, how many fuel-injected engines can be tuned up in 37.5 hrs? Round to the nearest whole number

Known fact 7 hrs to tune-up 9 engines

Unknown 37.5 hr to tune-up x engines

Estimation 35 hrs to tune-up 45 engines

$$\frac{7}{37.5} = \frac{9}{x}$$

$$7x = 337.5$$

$$x = 48.2$$

37.5 hrs to tune-up 48 engines

4) A costume maker took 9 hrs to make 4 headpieces for a Mardi Gras ball. At this rate, how many complete headpieces can be made in 35 hrs?

Known fact 9 hrs to make 4 headpieces

Unknown 35 hrs to make x headpieces

Estimate 36 hrs to make 16 headpiece

$$\frac{9}{35} = \frac{4}{x}$$

$$9x = 140$$

$$x = 15.6$$

35 hrs to make 15 pieces

5) How far can a family travel in 5 days if it travels at the rate of 855 mi in 3 days?

Known 3 days can travel 855 mi

Unknown 5 days can travel x mi

$$\frac{3}{5} = \frac{855}{x}$$

$$3x = 4275$$

$$x = 1425$$

Estimation 3 days can travel around 850 mi

6 days can travel 1700 mi

5 days must be between 850 and 1700 mi

5 days can travel 1425 mi

6) How far can a tractor-rig travel in 8 days if it travels at the rate of 1680 mi in 4 days?

Known 4 days can travel 1680 mi
 Unknown 8 days can travel x mi
 4 days is about 1700 mi
 8 days is close to 3400 mi

$$\frac{4}{8} = \frac{1680}{x}$$

$$4x = 13440$$

$$x = 3360 \text{ mi.}$$

8 days can travel 3360 mi

7) How much insecticide does 275 acres of farmland need if the insecticide treats 50 acres per 100 lb?

100 lb covers 50 acres
 x lb covers 275 acres

$$\frac{100}{x} = \frac{50}{275}$$

$$50x = 27500$$

$$x = 550$$

550 lbs covers 275 acres

400 lbs covers 200 acres 275 acres
 500 lbs covers 250 acres may need
 600 lbs covers 300 acres between
 500 and 600 lb

8) How much fertilizer does 2625 ft^2 of lawn need if the fertilizer treats 1575 ft^2 per gallon? Express the answer to the nearest tenth of a gallon.

1 gallon treats 1575 ft^2
 x gallons treat 2625 ft^2

$$\frac{1}{x} = \frac{1575}{2625}$$

$$1575x = 2625$$

$$x = 1.7 \text{ gal}$$

1 gal treats about 1600 ft^2
 2 gal treats about 3200 ft^2
 We need between 1 and 2 gal

1.7 gal will treat 2625 ft^2

9) Two gears have a ratio of 8 to 2. If the larger gear has 48 teeth, how many does the smaller gear have?

1 larger gear to smaller gear
 8 teeth to 2 teeth
 48 teeth to x teeth

$$\frac{8}{48} = \frac{2}{x}$$

$$8x = 96$$

$$x = 12$$

Larger gear ratio multiplied by 6 is 48 teeth
 so smaller gear should have 12 teeth

12 teeth on smaller gear

10) Two gears have a ratio of 9 to 4. If the larger gear has 72 teeth, how many does the smaller gear have?

larger gear to smaller
 9 teeth for every 4 teeth
 72 teeth for every x teeth

$$\frac{9}{72} = \frac{4}{x}$$

$$9x = 288$$

$$x = 32$$

Larger gear multiplied by 8 is 72 teeth
 smaller gear should be 32 teeth

32 teeth on smaller gear