

Resource sheet PR5

Pupils' solutions to proportion problems: Stacking CDs

Kelsey's solution

9 CDs put side by side on a shelf measure 5 cm. How many centimetres would 14 CDs placed side by side measure?

Handwritten solution on grid paper:

$$\frac{0.55}{9} = \frac{x}{5}$$

1 CD \approx 0.55 cm wide

$$\begin{array}{r} \times 14 \\ 0.55 \\ \hline 7.7 \text{ cm} \end{array}$$

14 CDs side by side would measure 7.7 cm

David's solution

9 CDs put side by side on a shelf measure 5 cm. How many centimetres would 14 CDs placed side by side measure?

Handwritten solution on grid paper:

$$\frac{1}{2} \text{ of } 9 = 4\frac{1}{2} \text{ CDs}$$
$$\frac{1}{2} \text{ of } 5 \text{ cm} = 2\frac{1}{2} \text{ cm}$$

9 CDs + $4\frac{1}{2}$ CDs about 14 CDs
5 cm + $2\frac{1}{2}$ cm about 7.5 cm

Joanne's solution

9 CDs put side by side on a shelf measure 5 cm. How many centimetres would 14 CDs placed side by side measure?

approx: 0.5
 $9 \overline{) 5.0}$

1 cd = approx 0.5

0.5	0.5
14	14
7.0	2.0
0.0	5.0
	7.0

14 cds = 7.0 cm (approx)

Simba's solution

9 CDs put side by side on a shelf measure 5 cm. How many centimetres would 14 CDs placed side by side measure?

Ratio	9 CDs	5 cm	
	14 CDs	more	

=> $\frac{14 \text{ CDs}}{9 \text{ CDs}} \times 5 \text{ cm} = 7.77777778$

$= 7.8 \text{ cm (1 dp)}$

Bina's solution

9 CDs put side by side on a shelf measure 5 cm. How many centimetres would 14 CDs placed side by side measure?

Handwritten solution on grid paper:

$$9 = 5 \text{ cm} \quad 9 \div 5 = 1.8 \text{ mm}$$

$$1 \text{ cd} = 1.8 \text{ mm} \quad 14 \times 1.8 \text{ mm} = 25.2 \text{ cm}$$

Lee's solution

9 CDs put side by side on a shelf measure 5 cm. How many centimetres would 14 CDs placed side by side measure?

Handwritten solution on grid paper:

$$\begin{array}{r} 0.555 \\ 9 \overline{) 5.000} \end{array} \quad -0.55 \times \begin{array}{r} 2.75 \\ 2 \overline{) 5.50} \end{array}$$

$$2.75 + 5 = 7.75 \text{ cm}$$

the length of 14 CD will be 7.75 cm.

Resource sheet PR6

Pupils' solutions to proportion problems: Coursework

Asjad's solution

For a coursework task Ben gained $\frac{5}{8}$ of the available marks, while Natasha gained $\frac{2}{3}$.
Who got the better mark?

$$\begin{aligned} 5/8 &= 100 \div 8 = 12.5 \times 5 \\ &= 62.5 \text{ Ben's mark out of 100} \\ 2/3 &= 100 \div 3 = 33.\dot{3} \times 2 \\ &= 66.6 \text{ Natasha's mark} \\ \text{Natasha got a higher mark than Ben.} \end{aligned}$$

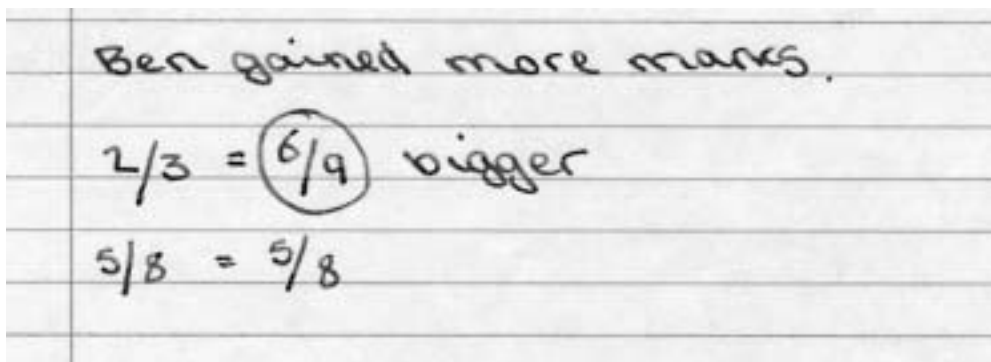
Daniel's solution

For a coursework task Ben gained $\frac{5}{8}$ of the available marks, while Natasha gained $\frac{2}{3}$.
Who got the better mark?

$$\begin{aligned} \text{Ben got } 5/8 \\ 5 \div 8 &= 0.625 \\ \text{Natasha got } 2/3 \\ 2 \div 3 &= 0.66\dot{6} \\ \text{this means Natasha got the better mark} \end{aligned}$$

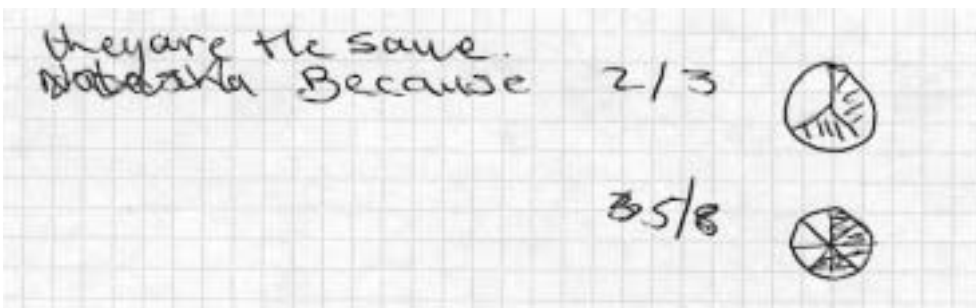
Zakir's solution

For a coursework task Ben gained $\frac{5}{8}$ of the available marks, while Natasha gained $\frac{2}{3}$. Who got the better mark?



Danny's solution

For a coursework task Ben gained $\frac{5}{8}$ of the available marks, while Natasha gained $\frac{2}{3}$. Who got the better mark?



Natasha's solution

For a coursework task Ben gained $\frac{5}{8}$ of the available marks, while Natasha gained $\frac{2}{3}$.
Who got the better mark?

Natasha
because she has $\frac{2}{3}$ which is $\frac{1}{3}$ away from 1, whereas Ben has $\frac{5}{8}$ which is $\frac{3}{8}$ away from 1, so therefore Natasha has the highest mark.

Sam's solution

For a coursework task Ben gained $\frac{5}{8}$ of the available marks, while Natasha gained $\frac{2}{3}$.
Who got the better mark?

Common denominator of 8 & 3

8	16	24	32	Common
3	6	9		denominator is =
24				3

$8 \overline{) 24} = 3$

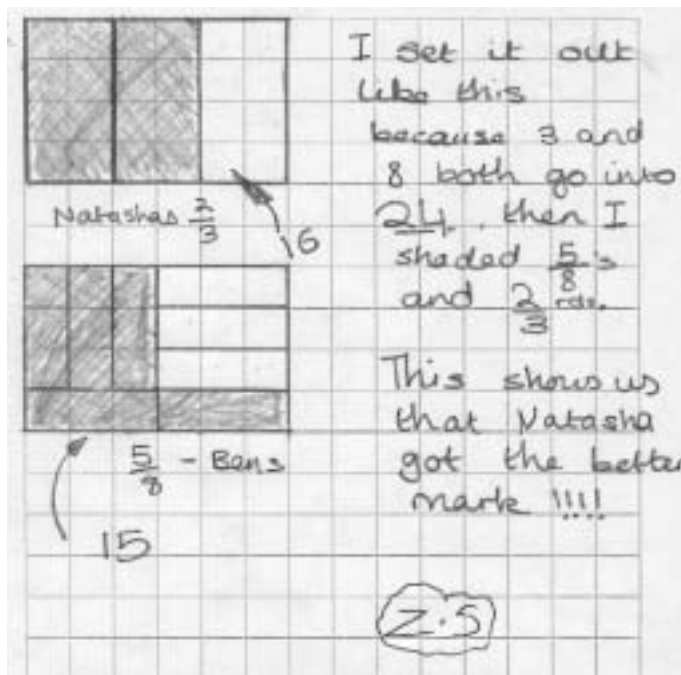
$= \frac{2}{3}$ is the better mark

$\frac{2}{3}$	$\frac{15}{24}$	B
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$\frac{5}{8}$	$\frac{15}{24}$	Natasha =
		15.16

Sarah's solution

For a coursework task Ben gained $\frac{5}{8}$ of the available marks, while Natasha gained $\frac{2}{3}$.
Who got the better mark?



Resource sheet PR7

Pupils' solutions to proportion problems: Similar triangles

Natalie's solution

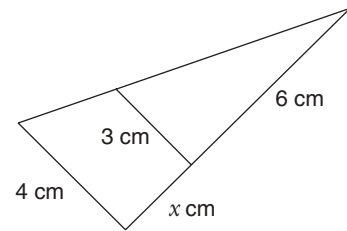
The two triangles are similar. Calculate x .

$$\frac{1.33}{3} \approx 1.3$$

$$3 \overline{) 4.00}$$

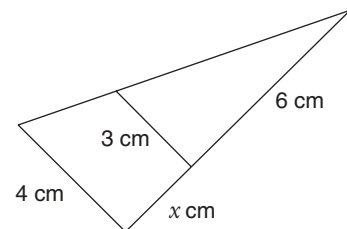
$$6 \times 6 \times 1.3 = 7.8$$

$$7.8 - 6 = 1.8$$
 answer ≈ 1.8 cm



Robert's solution

The two triangles are similar. Calculate x .



$$3 \times 6 = 18 \quad = 9 \div 2 \quad = 18 \div 2$$

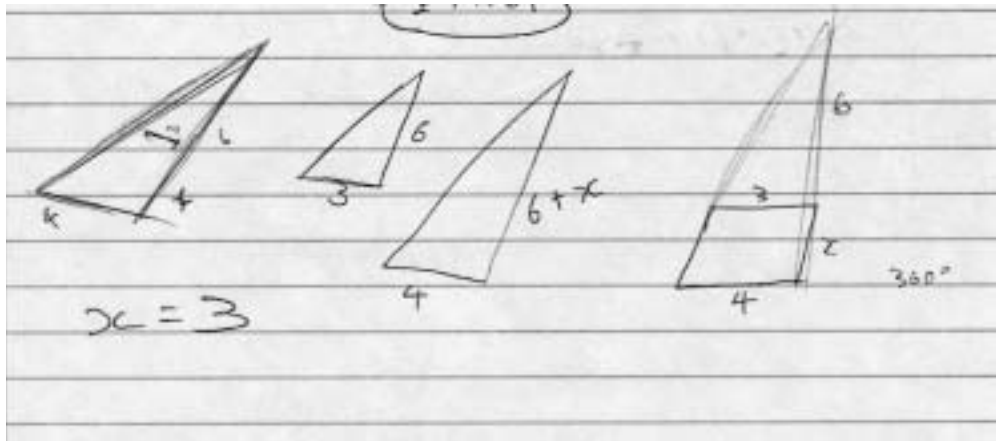
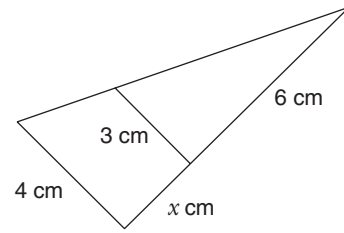
$$= 18 \div 2 \quad = 4.5 \quad x = 9 \text{ cm}$$

$$= 9 \text{ cm} \quad = 4.5 \times 4$$

$$= 18$$

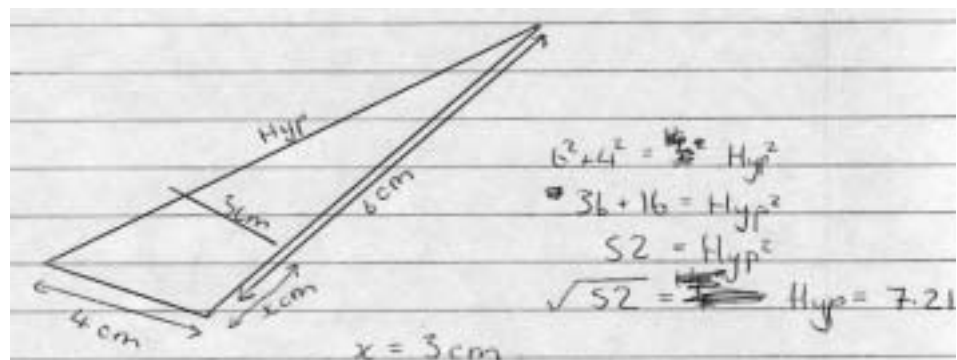
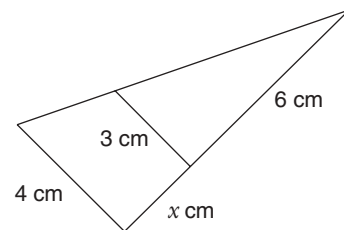
Kwon Joo's solution

The two triangles are similar. Calculate x .



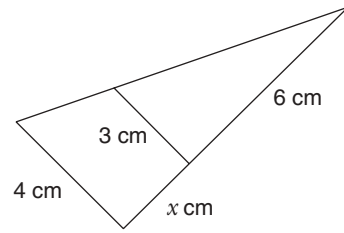
Michael's solution

The two triangles are similar. Calculate x .



Zoe's solution

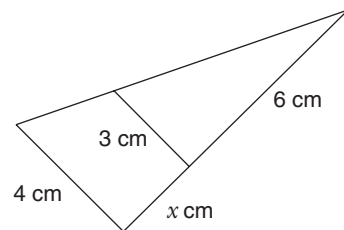
The two triangles are similar. Calculate x .



$$\begin{array}{l} \text{s/s} \quad 3 : 6 \\ \text{b/b} \quad 4 : 8 \end{array} \quad \frac{3}{4} = \frac{6}{8} \quad \frac{8}{6} = 2 \text{ cm} \quad x = 2 \text{ cm}$$

Jack's solution

The two triangles are similar. Calculate x .



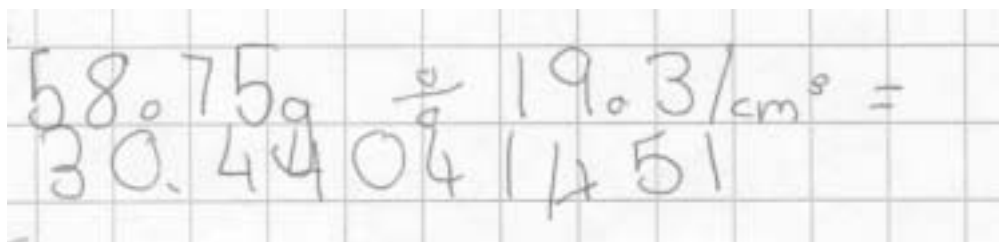
at 3 cm the height is doubled to 6 cm so therefore
at 4 cm the length will be 8 cm

Resource sheet PR8

Pupils' solutions to proportion problems: Gold brooch

Vamezy's solution

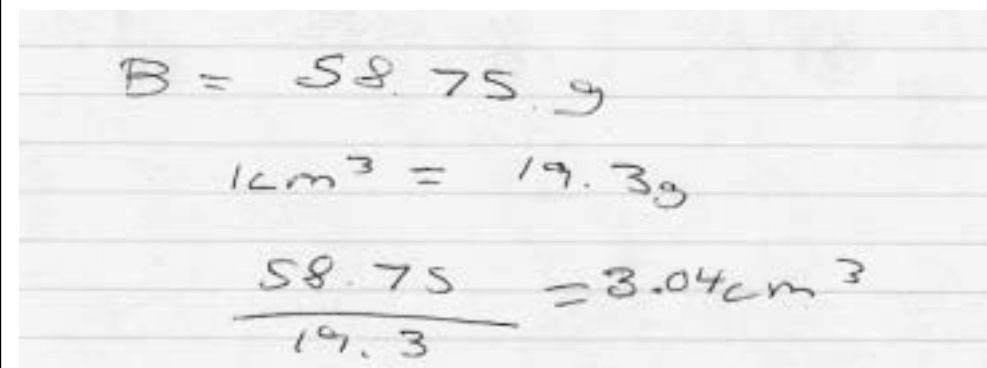
A gold brooch weighs 58.75 g. The density of gold is 19.3 g/cm³. What volume of gold is used to make the brooch?



Handwritten solution on grid paper showing the calculation: $58.75 \text{ g} \div 19.3 \text{ g/cm}^3 = 3.044041451$

James's solution

A gold brooch weighs 58.75 g. The density of gold is 19.3 g/cm³. What volume of gold is used to make the brooch?



Handwritten solution on lined paper showing the calculation: $B = 58.75 \text{ g}$, $1 \text{ cm}^3 = 19.3 \text{ g}$, and $\frac{58.75}{19.3} = 3.04 \text{ cm}^3$

Kieran's solution

A gold brooch weighs 58.75 g. The density of gold is 19.3 g/cm³. What volume of gold is used to make the brooch?

57.9 g of gold is used to make the brooch

$$\begin{array}{r} 19.3 \\ \times 3 \\ \hline 57.9 \end{array}$$

$$\begin{array}{r} 19.3 \\ 19.3 \\ + 19.3 \\ \hline 57.9 \end{array}$$

~~19.3~~ 3.0 cm³

Lee's solution

A gold brooch weighs 58.75 g. The density of gold is 19.3 g/cm³. What volume of gold is used to make the brooch?

$$\begin{array}{r} 58.75 \\ 19.30 \\ \hline 3.045 \end{array}$$

Gold = 3.05 cm³ g Gold = 3.05 cm³

Xenan's solution

A gold brooch weighs 58.75 g. The density of gold is 19.3 g/cm³. What volume of gold is used to make the brooch?

$$\begin{aligned}
 & \text{3.5 cm} \times 3.5 \text{ cm} \times 3.5 \text{ cm} = 42.875 \\
 & 3.75 \text{ cm} \times 3.75 \text{ cm} \times 3.75 \text{ cm} = 52.73 \\
 & 3.8 \text{ cm} \times 3.8 \text{ cm} \times 3.8 \text{ cm} = 54.87 \\
 & 3.9 \text{ cm} \times 3.9 \text{ cm} \times 3.9 \text{ cm} = 59.319 \\
 & \text{3.85 cm} \times 3.85 \text{ cm} \times 3.85 \text{ cm} = 57.07 \\
 & 3.87 \text{ cm} \times 3.87 \text{ cm} \times 3.87 \text{ cm} = 57.96 \\
 & 3.89 \text{ cm} \times 3.89 \text{ cm} \times 3.89 \text{ cm} = 58.86 \\
 & \text{estimate. } \text{3.9 cm}^3
 \end{aligned}$$

Percy's solution

A gold brooch weighs 58.75 g. The density of gold is 19.3 g/cm³. What volume of gold is used to make the brooch?

$$\begin{aligned}
 \text{Volume} &= \frac{\text{Weight}}{\text{Density}} \\
 &= \frac{58.75}{19.3} \\
 &= 3.04
 \end{aligned}$$