

Given that $884 \div 34 = 26$, work out:

$$0.34 \times 2.6$$

$$0.884$$

Given $\frac{84 \times 45}{35} = 108$, what is $\frac{8.4 \times 0.45}{10.8}$?

$$0.35$$

Use a calculator to work out:

$$\frac{(6.2 - 3.9)^2}{1.25}$$

$$4.232$$

Put brackets into this calculation to make it correct:

$$14.5 - 2.6 \times 4.5 - 3.6 = 49.95$$

$$(14.5 - 2.6) \times 4.5 - 3.6 = 49.95$$

Without using a calculator, work out:

$$5.12 \times 4.6$$

$$23.552$$

Without using a calculator, work out:

$$58.2 \div 0.03$$

$$\begin{aligned} \frac{58.2}{0.03} &= \frac{5820}{3} \\ &= 1940 \end{aligned}$$

Without using a calculator, work out:

$$4\frac{3}{4} - 2\frac{7}{10}$$

$$\begin{aligned} \frac{19}{4} - \frac{27}{10} &= \frac{95 - 54}{20} \\ &= \frac{41}{20} \\ &= 2\frac{1}{20} \end{aligned}$$

Without using a calculator, work out:

$$2\frac{2}{3} \times 1\frac{4}{5}$$

$$\begin{aligned} \frac{8}{3} \times \frac{9}{5} &= \frac{24}{5} \\ &= 4\frac{4}{5} \end{aligned}$$

<p>Express 45cm as a percentage of 2m.</p>	<p>Hugh's salary is £25 000. He is given a pay rise of 4%. What is his new salary?</p>
<p>22.5%</p>	<p>£26 000</p>
<p>Write down the multiplier used to increase an amount by 9%.</p>	<p>Write down the multiplier used to decrease an amount by 12%.</p>
<p>1.09</p>	<p>0.88</p>
<p>Tom bought a box of 12 oranges for £2. He sold them for 21p each. Work out his percentage profit.</p>	<p>£4000 is invested at 5% interest per year. How much interest is earned after 2 years?</p>
$\begin{aligned} \text{\% profit} &= \frac{\text{change in value}}{\text{original value}} \\ &= \frac{21 \times 12 - 200}{200} \times 100 \\ &= \frac{52}{2} \\ &= 26\% \end{aligned}$	$\begin{aligned} 4000 \times 1.05^2 &= 4410 \\ \text{Interest} &= 4410 - 4000 \\ &= \text{\pounds}410 \end{aligned}$
<p>A new car costs £8000. If the value depreciates by 10% each year, what is it worth after 3 years?</p>	<p>If the population increases by 8% each year and is presently 56 000, after how many years will the population exceed 100 000?</p>
$8000 \times 0.9^3 = \text{\pounds}5832$	$\begin{aligned} 56000 \times 1.08^x &= 100000 \\ 1.08^x &= \frac{25}{14} \\ x &= \log_{1.08} \left(\frac{25}{14} \right) = 7.5339\dots \\ &= 8 \end{aligned}$ <p>Or go through year by year, multiplying by 1.08.</p>

In 2004, the price of a washing machine was £376 including VAT at 17.5%. What was the cost before VAT?

$$1.175x = 376$$

$$x = \frac{376}{1.175}$$

$$= \text{£}320$$

In a sale, all jackets are reduced by 20%. If the sale price of a jacket is £33.60, what was the original price?

$$0.8x = 33.6$$

$$x = \frac{33.6}{0.8}$$

$$= \text{£}42$$

y is inversely proportional to x . When $y = 8$, $x = 2$. Find y when $x = 4$.

$$y = 4$$

Estimate:

$$\frac{6.8 \times 19.9}{12.1}$$

Choose denominators which divide easily:

$$\frac{7 \times 20}{10} = 14 \quad \text{or} \quad \frac{7 \times 20}{14} = 10$$

What are the upper and lower bounds of £120 to the nearest £?

Upper bound = £120.50

Lower bound = £119.50

What are the upper and lower bounds of 45km to the nearest 5km?

Upper bound = 47.5km

Lower bound = 42.5km

What are the upper and lower bounds of 40.0cm to the nearest mm?

Upper bound = 40.05cm (400.5mm)

Lower bound = 39.95cm (399.5mm)

If $x = 4.8$ and $y = 2.4$, both correct to one decimal place, what is the lower bound of xy ?

Multiply the two lower bounds:

$$\text{Lower bound} = 4.75 \times 2.35$$

$$= 11.1625$$

If $x = 4.8$ and $y = 2.4$, both correct to one decimal place, what is the upper bound of $x \div y$?

Divide the upper bound by the lower bound:

$$\begin{aligned} \text{Upper bound} &= 4.85 \div 2.35 \\ &= 2.06382\dots \end{aligned}$$

Dave ran 100m (to the nearest metre) in 11.00s (to the nearest hundredth of a second). What is his slowest possible speed?

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

Divide the lower bound by the upper bound:

$$\text{Speed} = \frac{99.5}{11.005} = 9.04 \text{ m/s}$$

List all the integers which satisfy the inequality $-4 < 2n \leq 3$.

-1, 0, 1

What is the reciprocal of 0.625?

$$0.625 = \frac{5}{8}$$

$$\text{Reciprocal} = \frac{8}{5} = 1.6$$

Express 108 as a product of its prime factors.

$$2^2 \times 3^3$$

Find the highest common factor of 108 and 24.

12

Evaluate:

$$16^{\frac{3}{4}}$$

$$\begin{aligned} 16^{\frac{3}{4}} &= \sqrt[4]{16^3} \\ &= 8 \end{aligned}$$

Evaluate:

$$\left(\frac{16}{25}\right)^{-\frac{3}{2}}$$

$$\begin{aligned} \left(\frac{16}{25}\right)^{-\frac{3}{2}} &= \sqrt{\left(\frac{25}{16}\right)^3} \\ &= \frac{125}{64} \end{aligned}$$

Write $\sqrt{48}$ in the form $k\sqrt{3}$ where k is an integer.

$$4\sqrt{3}$$

Give $(\sqrt{7} + 1)(5 - 2\sqrt{7})$ in the form $a + b\sqrt{c}$, where a , b and c are integers.

$$-9 + 3\sqrt{7}$$

Which of these is the odd one out? Explain.

$$\sqrt{40}, 2\sqrt{10}, \frac{\sqrt{160}}{2}, 2\sqrt{2}\sqrt{5}, \frac{\sqrt{640}}{4}$$

None of them.

They are all equal to $2\sqrt{10}$.

Convert the recurring decimal 0.343434... into a fraction in its simplest form.

$$\begin{aligned} x &= 0.343434\dots \\ 100x &= 34.343434\dots \\ 99x &= 34 \\ x &= \frac{34}{99} \end{aligned}$$

Without a calculator, work out:

$$83^2 - 17^2$$

Difference of two squares:

$$\begin{aligned} 83^2 - 17^2 &= (83 + 17)(83 - 17) \\ &= 100 \times 66 \\ &= 6600 \end{aligned}$$

Without a calculator, work out:

$$1.9^2 + 2 \times 1.9 \times 3.1 + 3.1^2$$

Using $x^2 + 2xy + y^2 = (x + y)^2$

$$\begin{aligned} (1.9 + 3.1)^2 &= 5^2 \\ &= 25 \end{aligned}$$