A cube has a volume of x^3 cm^3
Calculate the surface area of the cube in terms of x



$x \times x \times x = x^3$

$x \times x = x^2$

$x^2 \times 6$ faces $= 6x^2$ ..... cm²

Work out the difference between $\frac{3}{8}$ of 32 and $\frac{2}{5}$ of 40

12 and 16

..... 4

Expand $(\sqrt{2} + 1)(\sqrt{2} - 1)$

$\sqrt{4} - \sqrt{2} + \sqrt{2} - 1$

$2 + 0 - 1 = 1$

In a sale, the normal price of a car is reduced by 30%.
The sale price of the car is £5250
Work out the normal price of the car.

$100\% - 30\% = 70\%$

$70\% = 5250$ ÷7

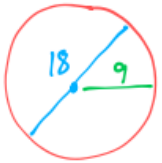
$10\% = 750$ ×10

$100\% = 7500$

Solutions by
Kenneth Stafford
MATHS TUTOR
ken@kennethstafford.co.uk

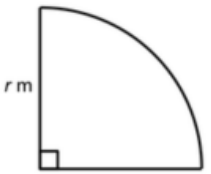
£ 7500

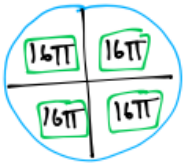
A circle has a circumference of 18π cm.
Calculate the area in terms of π



$9^2 \times \pi = 81\pi$ cm²

The area of the sector is 16π cm².
Find r





$16\pi \times 4 = 64\pi$

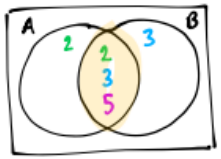
$r = \sqrt{64} = 8$

$3\frac{4}{9} \times 6$ $\quad \frac{31}{9} \times \frac{6}{1} = \frac{31 \times 6}{9 \times 1} = \frac{186}{9} = 20\frac{6}{9} = 20\frac{2}{3}$

$2\frac{4}{7} \div 3 = \frac{18}{7} \div \frac{3}{1} = \frac{18}{7} \times \frac{1}{3} = \frac{18 \times 1}{7 \times 3} = \frac{18}{21} = \frac{6}{7}$

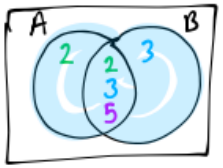
$A = 2^2 \times 3 \times 5$
$B = 2 \times 3^2 \times 5$

Find the HCF of A and B



$2 \times 3 \times 5 = 30$

Find the LCM of A and B



$2 \times 2 \times 3 \times 5 \times 3 = 180$

Evaluate $27^{-1/3}$

$\left(\frac{1}{27}\right)^{\frac{1}{3}} = \frac{\sqrt[3]{1}}{\sqrt[3]{27}} = \frac{1}{3}$

Evaluate 5^{-3}

$\left(\frac{1}{5}\right)^3 = \frac{1^3}{5^3} = \frac{1}{125}$

Evaluate $\left(\frac{64}{125}\right)^{-\frac{2}{3}}$

$\left(\frac{125}{64}\right)^{\frac{2}{3}} = \left(\frac{\sqrt[3]{125}}{\sqrt[3]{64}}\right)^2 = \left(\frac{5}{8}\right)^2 = \frac{25}{64}$

Evaluate $\left(\frac{9}{4}\right)^{-\frac{3}{2}}$

$\left(\frac{4}{9}\right)^{\frac{3}{2}} = \left(\frac{\sqrt{4}}{\sqrt{9}}\right)^3 = \left(\frac{2}{3}\right)^3 = \frac{8}{27}$

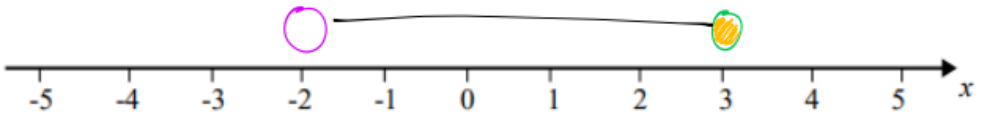
Can be any number

$3y = -\frac{3}{7}x + 24$ $\quad y = -\frac{1}{7}x + 10$

Equation of a line that is parallel ... $y = -\frac{1}{7}x + 10$

Equation of a line that is perpendicular ... $y = 7x + 10$

On the number line show the inequality $-2 < x \leq 3$



$-11 \leq 3y - 8 < 1$ where y is an integer.
Write down all the possible values of y.

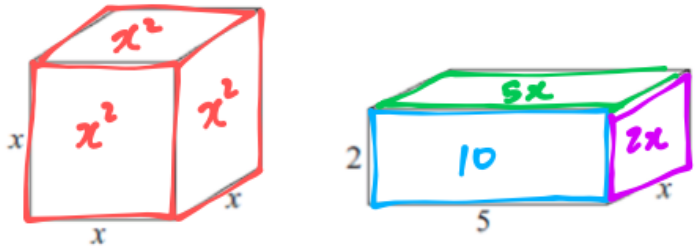
$-3 \leq 3y < 9$
$-1 \leq y < 3$

-1, 0, 1, 2

Solve $2(3x + 4) < 4(x + 7)$

$6x + 8 < 4x + 28$
$2x + 8 < 28$
$2x < 20$
$x < 10$

The cube and the cuboid have the same surface area.
Find the value of x



$5x + 2x + 10 = 7x + 10$
$\times 2$
$14x + 20$

$6x^2 = 14x + 20$
$6x^2 - 14x - 20 = 0$
$3x^2 - 7x - 10 = 0$
$(3x - 10)(x + 1) = 0$
$x = 10/3$ $x = -1$

$x = \frac{10}{3} = 3\frac{1}{3}$

Simplify

$$\frac{4x + 20}{x^2 - 25} = \frac{4(x+5)}{(x+5)(x-5)} = \frac{4}{x-5}$$

Simplify

$$\frac{x+4}{x+2} \div \frac{x+4}{x+6} = \frac{x+4}{x+2} \times \frac{x+6}{x+4} = \frac{(x+4)(x+6)}{(x+2)(x+4)} = \frac{x+6}{x+2}$$

One electron has a mass of 5×10^{-20} grams.
Find the mass of 300 of these electrons.
Give your answer in standard form.

$5 \times 10^{-20} \times 300 = 1500 \times 10^{-20} = 1.5 \times 10^{-17}$

$5 \times 10^{-20} \times 3 \times 10^{2} = 5 \times 3 \times 10^{-20+2} = 15 \times 10^{-18} = 1.5 \times 10^{-17}$

Write these numbers in order of size.
Start with the smallest number.

450	4500	4.5	45
4.5×10^2	0.045×10^5	450×10^{-2}	45×10^0

450×10^{-2} 45×10^0 4.5×10^2 0.045×10^5