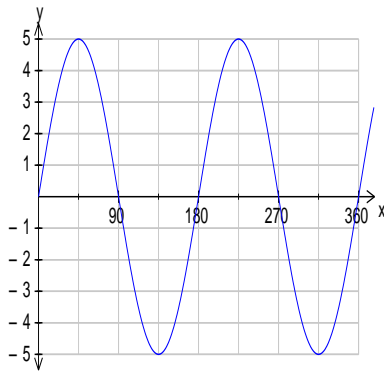
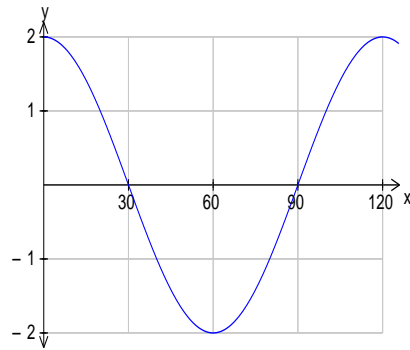


1. Find the equation of each of these trig graphs.

(a)



(b)



2. Simplify, leaving your answer in index form:

(a)  $3^3 \times 3^2$

(b)  $x^{\frac{1}{2}} \times x^{\frac{3}{2}}$

(c)  $a^5 \div a^{-2}$

(d)  $(a^3)^2$

(e)  $\frac{a^2 \times a^4}{a^{-3}}$

(f)  $\frac{p^{\frac{1}{2}} \times p^{\frac{3}{4}}}{p}$

3. Evaluate:

(a)  $2^{-3}$

(b)  $8^{\frac{2}{3}}$

(c)  $81^{\frac{3}{4}}$

(d)  $27^{-\frac{2}{3}}$

4. Express with a rational denominator:

(a)  $\frac{5}{\sqrt{3}}$

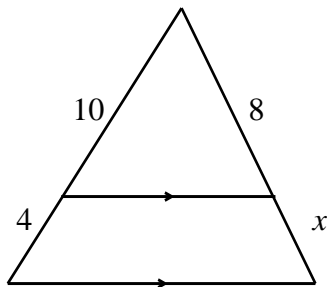
(b)  $\sqrt{\frac{4}{9}}$

(c)  $\frac{15}{2\sqrt{5}}$

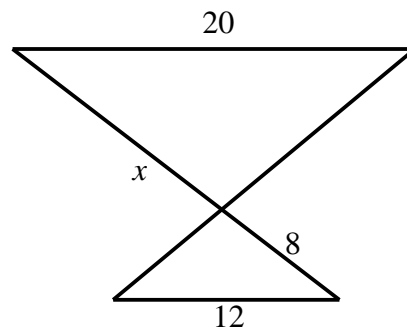
(d)  $\sqrt{\frac{3}{24}}$

5. In each of the following find the value of  $x$ .

(a)

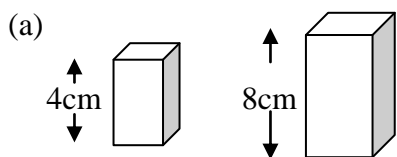


(b)



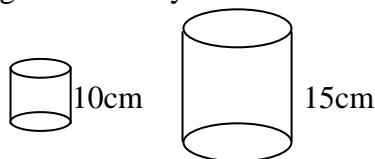
6. The hypotenuse of an isosceles right-angled triangle measures 24cm. Calculate the perimeter of the triangle.

7. Pairs of mathematically similar containers are shown below.

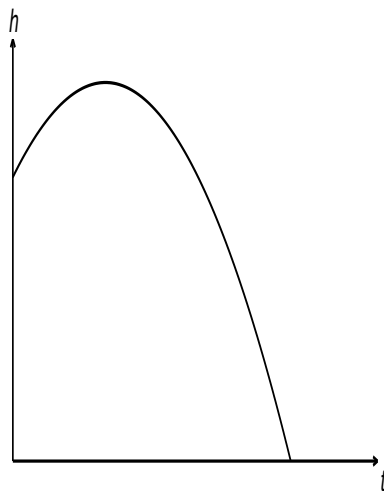


The volume of the small cuboid is  $106\text{cm}^3$ . Find the volume of the large one.

- (b) The weight of the small container is 1.4kg. Find the weight of the larger one if they are made of the same material.

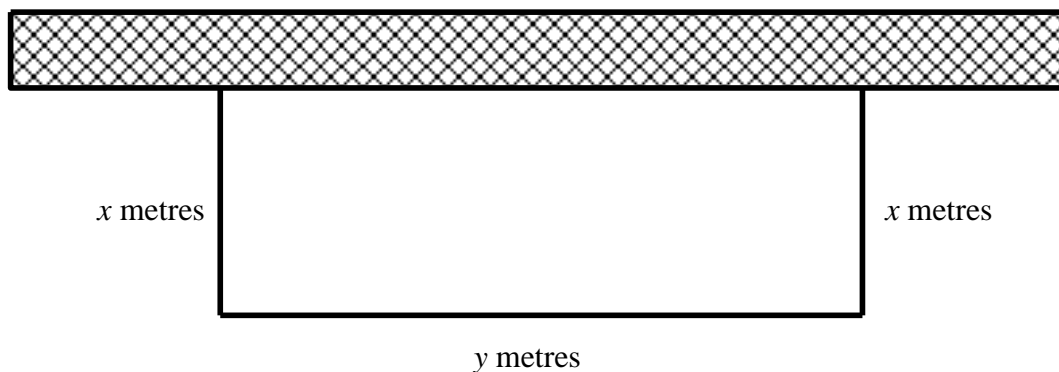


8. The diagram shows the path of a flare after it is fired. The height,  $h$  metres above sea level, of the flare is given by  $h = 48 + 8t - t^2$  where  $t$  is the number of seconds after firing.



Calculate, algebraically, the time taken for the flare to enter the sea.

9. The diagram shows a large rectangular pen to hold sheep. One side of the rectangle is a wall and the other three sides are made of fencing. The total length of fencing is 200 metres.



10. (a) Remove brackets and collect like terms  $3a - 2b - 2a - 5b$ .  
 (b) Solve algebraically the equation  $2x^2 - 9x - 5 = 0$ .  
 (c) Solve algebraically the equation  $\frac{x}{2} - \frac{x+1}{3} = 4$ .