1.   Find the equation of the line, AB, shown in the diagram.
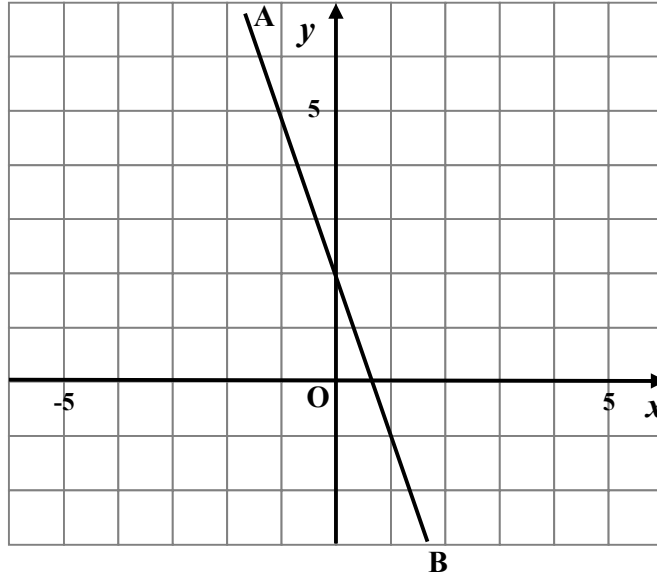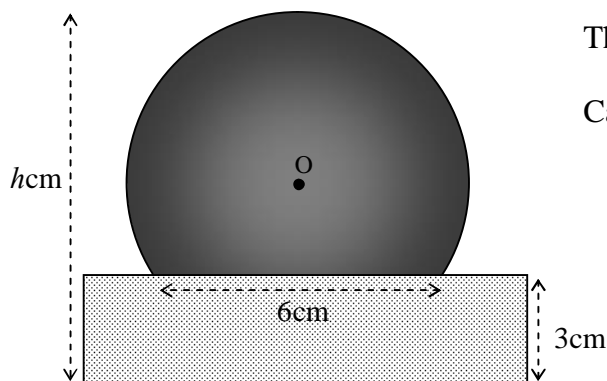

2.
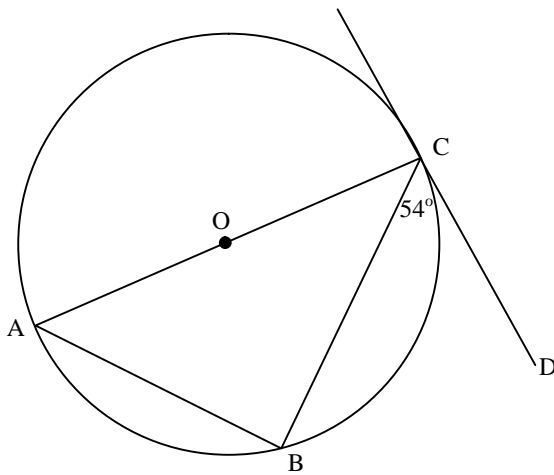
AC is a diameter and O is the centre
of the circle shown opposite. CD is a tangent
to the circle with C the point of contact.

If $\angle BCD = 54^\circ$,
find the size of $\angle CAB$.

3. A bowling trophy consists of a glass circle set into a rectangular wooden plinth as shown in the diagram. The diameter of the circle, centre O, is 8cm and the height of the plinth is 3 cm.

The width of the glass at the plinth is 6cm.

Calculate the height, h cm, of the trophy.

$h$cm

6cm

3cm

4. An inter-city train is made up from first class (**F**) and second class (**S**) carriages.

 (a) If the total number of carriages is 15, construct an equation in **F** and **S** which illustrates this situation.

 (b) The first class carriages are designed to carry 40 passengers and the second class carriages are designed to carry 54 passengers.

 If the total number of passengers that the train can carry is 768, construct another equation in **F** and **S** to illustrate this information.

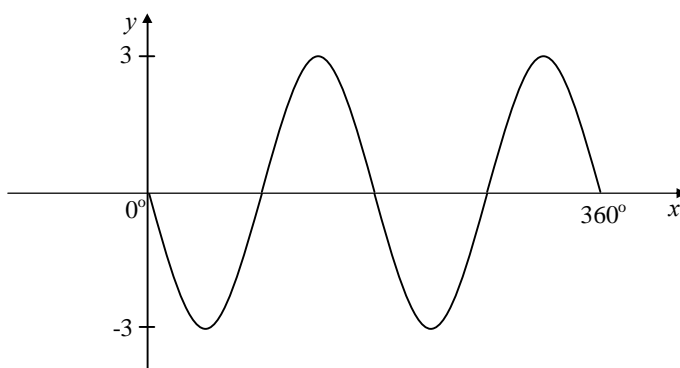 **(c)** Calculate how many of each type of carriage make up this train.

5. A formula used in Physics is $\qquad K = \dfrac{1}{2}mv^2$

 Change the subject of the formula to v.

6. Solve the quadratic equation $\qquad 3x^2 + 5x - 7$

 Give your answers correct to 1 decimal place.

7. The graph below has equation of the form $y = a\sin bx°$.
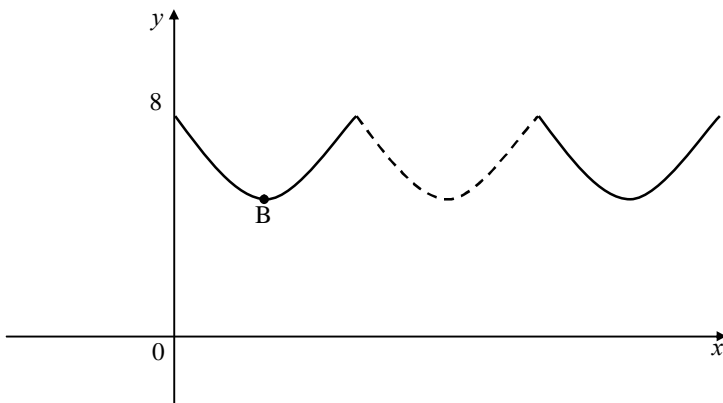 Write down the values of a and b.

8. Solve the equation $15\sin x° + 7 = 0$, $\quad 0 \le x \le 360$

9. Simplify $\dfrac{1 - \cos^2 x}{\sin x}$

10. If $\sin x° = \dfrac{1}{5}$ and $\cos x° = \dfrac{2\sqrt{6}}{5}$ find the value of $\tan x°$, giving your answer with a rational denominator.

11. The curtains in a window are draped in such a way that they form three identical parabolic shapes.

These parabolas can be represented on suitable axes as as shown in the diagram below:

(a) Given that the turning point B has coordinates (2, 5), find the equation of the parabola with this turning point.

(b) What is the equation of the axis of symmetry of the middle parabola? (shown in the diagram as a broken line)

END OF QUESTION PAPER