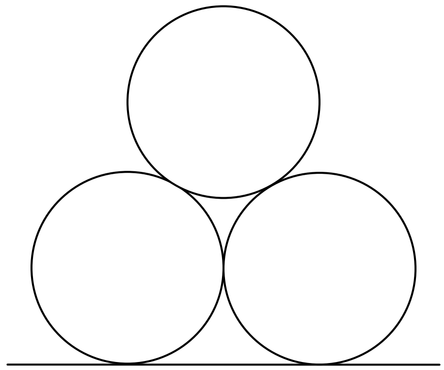
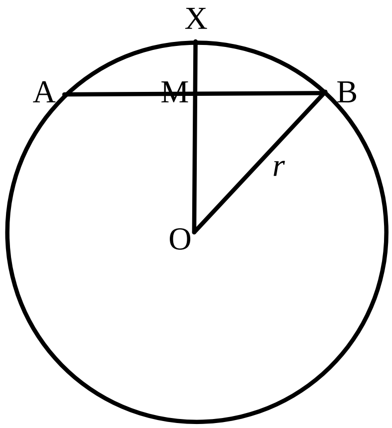
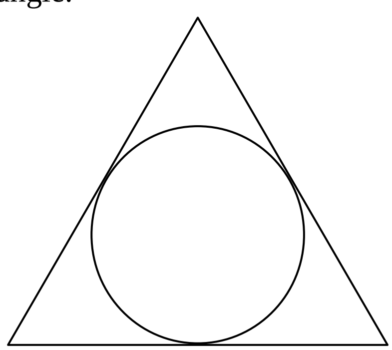
1. Each of the touching circles below has radius 10 cm.
   Find the total height of the stack.



2. In the circle below, $AB = 20\text{cm}$ and $XM = 4\text{cm}$.
   Find, algebraically, the radius of the circle.



3. The diagram below shows a circle inscribed in an equilateral triangle.
   The radius of the circle is 8cm.
   Calculate the perimeter of the triangle.



4. Solve these quadratic equations by factorisation:

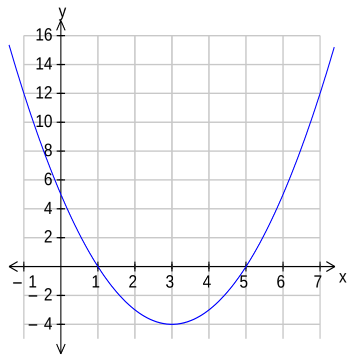
   (a) $8x = x^2$ (b) $2x^2 - 5x - 3 = 0$

5. Solve, giving the roots correct to 1 decimal place:

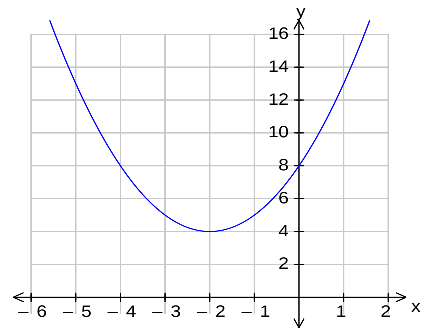
   (a) $2x^2 - x - 2 = 0$ (b) $x^2 + x - 3 = 0$

6. Write the equation of each of these graphs in the form $y=(x+a)^2+b$.

(a)



(b)



7. (a) Express $x^2-4x+11$ in the form $x-a\;^{2}+b$.

(b) Hence write down the coordinates of the minimum turning point of the graph of $y=x^2-4x+11$.

(c) Sketch the graph of $y=x^2-4x+11$. your graph should show the minimum turning point and the point of intersection with the *y*-axis.

8. A quadratic function has equation $f(x)=(x+2)^2-9$.

(a) Write down the equation of the axis of symmetry.
(b) Write down the coordinates of the minimum turning point.
(c) Find the coordinates of the point where the graph crosses the *y*-axis.
(d) Find the coordinates of the point where the graph crosses the *x*-axis.
(e) Sketch the curve, showing all the above information.

9. (a) Factorise $3x^2-6x$.

(b) Hence simplify $\dfrac{3x^2-6x}{x^2-4}$, $x\neq\pm2$.

10. (a) Express $\sqrt{72}-\sqrt{2}+\sqrt{8}$ as a surd in its simplest form.

(b) Express $\dfrac{3}{a}-\dfrac{5}{a+2}$, $a\neq 0,\ -2,$ as a single fraction.

(c) Express $x^2\left(2x^{-\frac{1}{2}}+x\right)$ in its simplest form.

(e) Express $\dfrac{x^{\frac{1}{2}}\times x^{\frac{5}{2}}}{x^2}$ in its simplest form.

11. Find the coordinates of the point of intersection of the lines with equations $2x+y=5$ and $x\text{ - }3y=6$.

12. Multiply out and collect like terms.

(a) $(3a-4)(2a+3)$ (b) $(3x-y)(3x+y)$

(c) $(3y-2)^2$ (d) $(x-2)(x^2+4x-3)$