Section 1: Trigonometric functions and identities

Exercise level 1

Do not use a calculator in this exercise.

1. Triangle ABC is right angled at B. AB = 10 cm and AC = 26 cm.
   (i) Calculate the length of BC.
   (ii) Write down the values of sin A, cos A, and tan A leaving your answers as fractions.
   (iii) Write down the values of sin C, cos C, and tan C leaving your answers as fractions.
   (iv) Write down three separate equations connecting the trig ratios for angle A to those for angle C.
   (v) In general, what conclusions can you draw from your answers to (iv)?

2. (i) Sketch the curve of $y = \tan x$ for angles between 0° and 360°.
   (ii) Add the line $y = 1$ to your sketch and mark the points where the graphs intersect. Find the values of x between 0° and 360° for which $\tan x = 1$.
   (iii) Without using a calculator, find the values of x in the interval 0° to 360° for which $\tan x = -1$.

3. Using a sketch of $y = \sin x$, write down all of the angles between 90° and 540°
   (i) that have the same sine as 40°;
   (ii) that have the same sine as 160°.

4. Find all of the values of x between 0° to 360° such that
   (i) $\cos x = \cos 25°$
   (ii) $\sin x = \sin 50°$
   (iii) $\tan x = \tan 120°$
   (iv) $\sin x = -\sin 60°$
   (v) $\cos x = -\cos 20°$