

TRIGONOMETRY

1. In separate, standard (x, y) -coordinate systems, with all angles in standard position, sketch the terminal sides of the angles.

a) 165° b) $\frac{4\pi}{3}$ (radians) c) -75° .

2. Find the length of the arc cut from a circle of radius 10 cm by the sides of a central angle (vertex at the center of the circle) of

a) 25° b) 0.5 (radians).

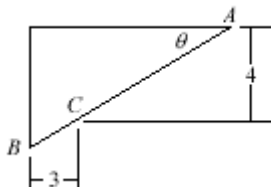
3. a) Consider a right triangle with angles A , B and C and opposite sides a , b , c , respectively. If C is 90° , find

i) $\sin A$ ii) $\tan B$ iii) $\csc B$
(express answers in terms of a , b , and c).

- b) If $c = 5$ and $b = 1$, find

i) $\cos A$ ii) $\cot A$ iii) $\sec B$
(Do not use a calculator – use radicals or fractions.)

4. Compute the distance AB shown in the figure, given that $\theta = 30^\circ$.



5. a) In a standard (x, y) -coordinate system a unit circle is drawn, with center at the origin. An angle θ is sketched, in standard position, and its terminal side meets the circle in the point (p, q) . What are the sine, cosine, and tangent of θ , in terms of p and q ?

- b) Compute, without calculator,

i) $\sin 300^\circ$ ii) $\sec\left(\frac{13\pi}{6}\right)$.

6. In triangle ABC , $A = 65^\circ$, $b = 9$, and $a = 10$. Find B .

7. The diagonals of a parallelogram are 20 cm and 30 cm long and intersect at an angle of 25° . Find the sides of the parallelogram.

8. Complete the following standard identities:

a) $\sin 2\theta =$ b) $\cos^2 \theta =$ (trig functions of 2θ) c) $\tan^2 \theta + 1 =$

9. Verify that the following are identities:

a) $\tan\left(\frac{x}{2}\right) = (\sec x - 1)/(\sin x \sec x)$ b) $\cos 3x = 4\cos^3 x - 3\cos x$

10. Find all solutions x in the interval $[0, 2\pi]$ for each of the following equations:

a) $\tan x = -\frac{1}{2}$ b) $2\sin x \cos^2 x - \sin^3 x = 0.$

11. Graph, separately, one period of

a) $y = \sin 2x$ b) $y = 0.5 \cos\left(\pi x - \frac{\pi}{4}\right)$

12. a) Sketch $y = \cos^{-1} x.$

b) Compute, without a calculator:

i) $\sin^{-1}\left(-\frac{1}{2}\right)$ ii) $\sin\left(2\sin^{-1}\left(\frac{3}{4}\right)\right)$

c) Solve for all x 's in $[0, 2\pi]$ satisfying $\sin(\cos^{-1} x) = x.$

13. If $x = 2 \tan u$, write $\frac{u}{16} + (\sin 2u)/32$ in terms of $x.$

14. Find, without a calculator, the real part of $(\cos 30^\circ + i \sin 30^\circ)^{10}.$