Trigonometry:

Formulae

1. $\operatorname{Cosec}\theta = \dfrac{1}{\sin\theta}$
2. $\operatorname{Sec}\theta = \dfrac{1}{\cos\theta}$
3. $\cot\theta = \dfrac{1}{\tan\theta} = \dfrac{\cos\theta}{\sin\theta}$
4. $\tan\theta = \dfrac{1}{\cot\theta} = \dfrac{\sin\theta}{\cos\theta}$.
5. $\sin^2\theta + \cos^2\theta = 1$.
6. $\sec^2\theta = 1 + \tan^2\theta$
7. $\operatorname{Cosec}^2\theta = 1 + \cot^2\theta$.

8.

θ	$0^\circ = 0^c$	$30^\circ = \frac{\pi}{6}$	$45^\circ = \frac{\pi}{4}$	$60^\circ = \frac{\pi}{3}$	$90^\circ = \frac{\pi}{2}$
$\sin\theta$	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
$\cos\theta$	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
$\tan\theta$	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	∞

* $\sin 2\theta = 2\sin\theta\cos\theta$
* $\cos 2\theta = \cos^2\theta - \sin^2\theta = 2\cos^2\theta - 1$
  $= 1 - 2\sin^2\theta$

9. Maximum value of $\sin\theta$, $-\sin\theta$, $\cos\theta$, $-\cos\theta$ is 1.
10. Minimum value of $\sin\theta$, $-\sin\theta$, $\cos\theta$, $-\cos\theta$ is -1.

11(a). Maximum value of $\sin^2\theta$ and $\cos^2\theta$ is 1.
11(b). Minimum value of $\sin^2\theta$ and $\cos^2\theta$ is 0 (zero).

12 (a). Maximum value of $-\sin^2\theta$ and $-\cos^2\theta$ is 0 (zero).
(b). Minimum value of $-\cos^2\theta$ and $-\sin^2\theta$ is -1.

13. For $x \in \mathbb{R}$, the range of $\sin x$, $\cos x$, $-\sin x$, $-\cos x$ is $-1 \le f(x) \le 1$

14. $f(x) = a + b\cos x$, $g(x) = a - b\cos x = a + b(-\cos x)$
$h(x) = a + b\sin x$, $m(x) = a - b\sin x = a + b(-\sin x)$.

(a)(i) Maximum value of $f(x)$, $g(x)$, $h(x)$ and $m(x)$ is $(a+b)$.
(ii) Minimum value of $f(x)$, $g(x)$, $h(x)$ and $m(x)$ is $(a-b)$.
(b) Amplitude of $f(x)$, $g(x)$, $h(x)$ and $m(x)$ is b.

15.(a). Period of $\sin x$, $-\sin x$, $\cos x$, $-\cos x$ is 360° and Period of $\tan x$ is 180°.
(b). Period of $\sin ax$, $\cos ax$, $-\sin ax$, $-\cos ax$ is $\dfrac{360^\circ}{a}$. and period of $\tan ax$ is $\dfrac{180^\circ}{a}$.

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