

## 10. Trigonometrical Identities and Equations

Name:	Class:	Date:
	Mark	/ 18 %

1) Simplify the following expression [1]

$$\cos 3x \tan 3x$$

2) Given that  $\sin x = \frac{40}{41}$  and that  $x$  is acute, find the exact value of  $\cos x$  and  $\tan x$ . [1]

3) Given that  $\tan x = -\frac{12}{35}$  and that  $x$  is obtuse, find the exact value of  $\sin x$  and  $\cos x$ . [1]

4) Given that  $\cos x = -\frac{1}{5}$  and that  $180 < x < 270$ , find the exact value of  $\sin x$  and  $\tan x$ . [1]

5) Find an equation in terms of  $p$  and  $q$  by eliminating  $x$  of the following [1]

$$p = 3 \cos x, \quad q = \sin x$$

6) Solve the following equation for  $x$ , in the interval  $0 \leq x \leq 360$ . [3]

a)  $\tan x = -1$

b)  $3 \tan x = -5$

c)  $2 \cos x = \sqrt{2}$

7) Solve the following equation for  $x$  in the given interval [6]

a)  $\tan x = -2.767, \quad -180 \leq x \leq 180$

b)  $\sin x = \frac{\sqrt{2}}{2}, \quad 0 \leq x \leq 720$

c)  $\sin x = \frac{\sqrt{3}}{2}, \quad -2\pi < x \leq \pi$

d)  $\cos 2x = -1, 0 \leq x \leq 360$

e)  $\cos(x - 35^\circ) = \frac{\sqrt{3}}{2}, 0 \leq x \leq 360$

f)  $\tan\left(x + \frac{\pi}{6}\right) = -1, -\pi \leq x \leq \pi$

8) Solve the following equation for  $x$  in the given interval leaving your answer to 3 significant figures. [1]

$$\sin(3x + 25^\circ) = 1, 0 \leq x \leq 360$$

9) Solve the following equation for  $x$ , in the interval  $0 \leq x \leq 360$ . Give your answers to 3 significant figures.

a)  $2\sin^2 x - 1 = 0$

[2]

b)  $\cos^2(x + 35^\circ) = \frac{1}{4}$

10) Solve the following equation for  $x$ , in the interval  $-180 \leq x \leq 360$ . Give your answers to 3 significant figures.

$$4\cos^2 x - 3 \cos x = 0$$

[1]

## Solutions for the assessment 10. Trigonometrical Identities and Equations

1)  $\cos 3x \tan 3x = \sin 3x$

2)  $\cos x = \frac{9}{41}$  and  $\tan x = \frac{40}{9}$

3)  $\sin x = \frac{12}{37}$  and  $\cos x = -\frac{35}{37}$

4)  $\sin x = -\frac{2\sqrt{6}}{5}$  and  $\tan x = 2\sqrt{6}$

5) Equation is:  $9p^2 + q^2 = 9$

6) a)  $x = 135, 315^\circ$

b)  $x = 121, 301^\circ$

c)  $x = 45, 315^\circ$

7) a)  $x = -70.1, 110^\circ$

b)  $x = 45, 135, 405, 495^\circ$

c)  $x = -\frac{5\pi}{3}, -\frac{4\pi}{3}, \frac{\pi}{3}, \frac{2\pi}{3}$

d)  $x = 90, 270^\circ$

e)  $x = 365, 425^\circ$

f)  $x = -\frac{5\pi}{12}, \frac{7\pi}{12}$

8)  $x = 21.6666666667, , 261.6666666667^\circ$

9) a)  $x = 30, 150, 210, 330^\circ$

b)  $x = 25, 265^\circ$

10)  $x = 41.4, 90, 270, 319^\circ$