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) \( \sin x = \frac{\sqrt{3}}{2}, \quad 0 \leq x \leq 720 \)
   c) \( \sin x = \frac{\sqrt{3}}{2}, \quad -2\pi < x \leq \pi \)
8) Solve the following equation for $x$ in the given interval leaving your answer to 3 significant figures. [1]

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

9) Solve the following equation for $x$, in the interval $0 \leq x \leq 360$. Give your answers to 3 significant figures. [2]

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

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. [1]

\[
4\cos^2 x - 3 \cos x = 0
\]
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) \(x = 41.4, 90, 270, 319^\circ\)