

## 20.3 Exercises

## Exercise 20.1

Find all solutions of the equation, and simplify as much as possible. Do not approximate the solution.

$\checkmark$  a)  $\tan(x) = \frac{\sqrt{3}}{3}$      $\checkmark$  b)  $\sin(x) = \frac{\sqrt{3}}{2}$      $\checkmark$  c)  $\sin(x) = -\frac{\sqrt{2}}{2}$      $\checkmark$  d)  $\cos(x) = \frac{\sqrt{3}}{2}$   
 e)  $\cos(x) = 0$     f)  $\cos(x) = -0.5$     g)  $\cos(x) = 1$     h)  $\sin(x) = 5$   
 i)  $\sin(x) = 0$     j)  $\sin(x) = -1$     k)  $\tan(x) = -\sqrt{3}$     l)  $\cos(x) = 0.2$

## Exercise 20.2

Find all solutions of the equation. Approximate your solution with the calculator.

$\checkmark$  a)  $\tan(x) = 6.2$      $\checkmark$  b)  $\cos(x) = 0.45$      $\checkmark$  c)  $\sin(x) = 0.91$   
 d)  $\cos(x) = -.772$     e)  $\tan(x) = -0.2$     f)  $\sin(x) = -0.06$

## Exercise 20.3

Find at least 5 distinct solutions of the equation.

a)  $\tan(x) = -1$     b)  $\cos(x) = \frac{\sqrt{2}}{2}$     c)  $\sin(x) = -\frac{\sqrt{3}}{2}$     d)  $\tan(x) = 0$   
 e)  $\cos(x) = 0$     f)  $\cos(x) = 0.3$     g)  $\sin(x) = 0.4$     h)  $\sin(x) = -1$

## Exercise 20.4

Solve for  $x$ . State the general solution without approximation.

$\checkmark$  a)  $\tan(x) - 1 = 0$      $\checkmark$  b)  $2 \sin(x) = 1$      $\checkmark$  c)  $2 \cos(x) + \sqrt{3} = 0$   
 d)  $\sqrt{2} \cos(x) - 1 = 0$     e)  $\sec(x) = -2$     f)  $\cot(x) = \sqrt{3}$

## Exercise 20.5

Solve for  $x$ . State the general solution without approximation.

a)  $2 \sin^2(x) - \sqrt{2} \sin(x) = 0$

c)  $2 \cos^2(x) + \sqrt{3} \cos(x) = 0$

e)  $\tan^2(x) - 3 = 0$

g)  $4 \sin^2(x) - 3 = 0$

i)  $\tan(x) \cos(x) + \sqrt{3} \cos(x) = 0$

k)  $4 \cos^2(x) - 4 \cos(x) + 1 = 0$

m)  $2 \sin^2(x) + \sin(x) - 1 = 0$

o)  $2 \cos^2(x) + 9 \cos(x) = 5$

b)  $\tan^2(x) + \tan(x) = 0$

d)  $\sin^2(x) + \sin(x) = 0$

f)  $4 \cos^2(x) - 1 = 0$

h)  $\cos(x) \sin(x) + \sin(x) = 0$

j)  $\cos^2(x) + 7 \cos(x) + 6 = 0$

l)  $2 \sin^2(x) + 11 \sin(x) = -5$

n)  $2 \cos^2(x) - 3 \cos(x) + 1 = 0$

p)  $\tan^3(x) - \tan(x) = 0$

## Exercise 20.6

Use the calculator to find all solutions of the given equation. Approximate the answer to the nearest thousandth.

a)  $2 \cos(x) = 2 \sin(x) + 1$

c)  $4 \cos^2(3x) + \cos(3x) = \sin(3x) + 2$

b)  $7 \tan(x) \cdot \cos(2x) = 1$

d)  $\sin(x) + \tan(x) = \cos(x)$