

## 4.3 Equivalent Trigonometric Expressions

BLM 4-7

- Given that  $\cos \frac{\pi}{6} = \frac{\sqrt{3}}{2}$ , use an equivalent trigonometric expression to show that  $\sin \frac{\pi}{3} = \frac{\sqrt{3}}{2}$ .
- Given that  $\tan \frac{\pi}{3} = \sqrt{3}$ , use an equivalent trigonometric expression to show that  $\cot \frac{5\pi}{6} = -\sqrt{3}$ .
- Given that  $\sin \frac{2\pi}{7} \approx 0.7818$ , use equivalent trigonometric expressions to evaluate the following, to four decimal places.
  - $\cos \frac{3\pi}{14}$
  - $\cos \frac{11\pi}{14}$
- Given that  $\cot \frac{2\pi}{9} \approx 1.1918$ , use equivalent trigonometric expressions to evaluate the following, to four decimal places.
  - $\tan \frac{5\pi}{18}$
  - $\tan \frac{13\pi}{18}$
- Given that  $\tan a = \cot 1.45$  and angle  $a$  lies in the first quadrant, use a cofunction identity to determine the measure of angle  $a$ , to two decimal places.
- Given that  $\cos x = \sin 0.79$  and that  $x$  lies in the second quadrant, determine the measure of angle  $x$ , to two decimal places.
- Mino finds that the **COS** key on his calculator is not working. Use a cofunction identity to determine another way that he can find  $\cos \frac{4\pi}{9}$  without using the **COS** key on his calculator.
- Use graphing technology to verify that  $\cos(3\pi - x) = -\cos x$ , where  $x$  lies in the first quadrant.
- Using the trigonometric identities for  $(\pi - x)$  and  $(x + \pi)$  that were added to your trigonometric identities table from questions 15 and 16 in the textbook and given that  $\cos \frac{\pi}{14} \approx 0.9749$ , find
  - $\cos \frac{13\pi}{14}$
  - $\cos \frac{15\pi}{14}$
- Using the trigonometric identities for  $\left(\frac{3\pi}{2} - x\right)$  and  $\left(x + \frac{3\pi}{2}\right)$  that were added to your trigonometric identities table from questions 17 and 18 in the textbook and given that  $\tan \frac{2\pi}{9} \approx 0.8391$ , find
  - $\cot \frac{23\pi}{18}$
  - $\cot \frac{31\pi}{18}$
- Determine an exact value of  $a$  such that  $\sec\left(3a - \frac{\pi}{4}\right) = -\csc\left(4a - \frac{\pi}{4}\right)$ .
  - Check your answer.