

Chapter 4 Test

BLM 4-12

For questions 1 to 4, select the best answer.

1. The exact radian measure of 220° is

A $\frac{2\pi}{9}$
 B $\frac{13\pi}{18}$
 C $\frac{21\pi}{18}$
 D $\frac{11\pi}{9}$

2. The exact value of $\csc \frac{7\pi}{6}$ is

A $\frac{\sqrt{3}}{2}$
 B -2
 C $-\frac{2}{\sqrt{3}}$
 D $\frac{1}{2}$

3. Given that $\sec \theta = -\sqrt{2}$ and θ lies in the third quadrant, the value of $\cot \theta$ is

A 1
 B $\frac{1}{\sqrt{2}}$
 C -1
 D $\frac{\sqrt{3}}{2}$

4. Simplify $\sin \frac{3\pi}{4} \cos \frac{\pi}{3} + \cos \frac{3\pi}{4} \sin \frac{\pi}{3}$.

A $\sin \frac{13\pi}{12}$
 B $\sin \frac{5\pi}{12}$
 C $\cos \frac{13\pi}{12}$
 D $\cos \frac{5\pi}{12}$

5. Determine an exact value for $\cos \frac{7\pi}{12}$.

6. A wheel of a child's car revolves at 15 rpm.

a) What is the angular velocity of the wheel in radians per seconds to two decimal places?

b) A painted dot on the circumference of the wheel is 12 cm from the centre of rotation of the wheel. How far does the dot travel in 5 s, to one decimal place?

7. A man is standing 35 m from a government building. On top of the building is a Canadian flag. From the man, the angle of elevation of the top of

the building is $\frac{\pi}{6}$ radians and the angle

of elevation of the top of the flag is

$\frac{\pi}{3}$ radians. Determine an exact

expression for the distance from the top of the flag to the top of the building.

8. Prove that

$$\sin 3a \cos a - \cos 3a \sin a = 2 \sin a \cos a.$$

9. Prove that $\frac{\cos 2x}{1 - \sin 2x} = \frac{\cos x + \sin x}{\cos x - \sin x}$.

10. Consider the equation

$2 \csc 2x = \cos x \csc x$. Either prove that the equation is an identity, or determine a counterexample to show that it is not an identity.