Name: _____ Date: _____

Chapter 1 Test

1. Which of the following has a value of $\frac{1}{2}$?

A sin 150°
B cos 60°
C both (a) and (b)
D neither (a) nor (b)

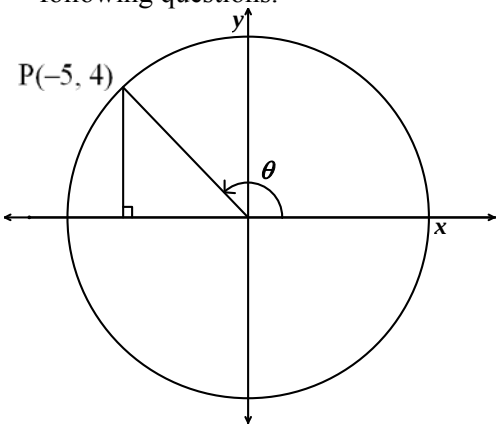
2. Determine the exact value of each of the following.

a) sin 30°
b) cos 240°
c) tan 315°

3. Use a calculator to evaluate each of the following, to four decimal places.

a) sin 70°
b) cos 205°
c) tan 340°

4. Use the diagram shown to answer the following questions.



a) State the exact values of the primary trigonometric ratios for $\angle\theta$.
b) Determine the value of $\angle\theta$ to the nearest degree.

5. If cos A = 0.2463, explain how to find the value of cos (180° + A) without the use of a calculator.

6. For each of the following, state the two quadrants in which you would find the terminal arm of angle β, drawn in standard position.

a) $\sin\beta = \frac{2}{3}$
b) $\cos\beta = -0.5$
c) $\tan\beta = 4$

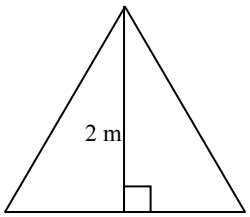
7. If $\cos\beta = \frac{3}{5}$, what is the answer to each of the following questions?

a) In which two quadrants might you find the terminal arm of $\angle\beta$, drawn in standard position?
b) Draw a diagram showing both possible terminal arms of $\angle\beta$.
c) If the terminal arm of $\angle\beta$ lies in quadrant IV, what are the exact values of $\sin\beta$ and $\tan\beta$?

8. For each of the following, determine two values for θ, where $0° \le \theta \le 360°$.

a) $\tan\theta = -1$
b) $\cos\theta = -\frac{1}{\sqrt{2}}$
c) $\sin\theta = \frac{\sqrt{3}}{2}$

9. The face of a tent is in the shape of an equilateral triangle, as shown in the diagram. If the height of the tent is 2 m, what is the width of the base, to the nearest tenth of a metre?



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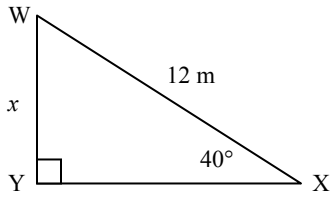
10. a) Use a calculator to evaluate the following, to four decimal places.
i) tan 80° **ii)** tan 85° **iii)** tan 89°
b) Describe what happens to the answer as the angle gets closer to 90°.
c) Explain why tan 90° is undefined. Include a diagram in your solution.

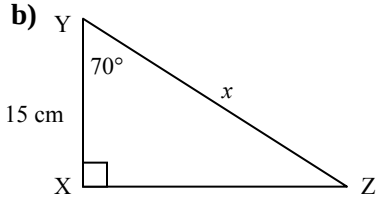
11. Use a calculator to find the two values of θ, where $0° \le \theta \le 360°$. Express your answers to the nearest degree.
a) $\sin\theta = 0.7880$
b) $\cos\theta = -0.1736$
c) $\tan\theta = -0.2679$

12. For the following diagrams, determine the value of x, to one decimal place.

a)



b)



13. In ΔABC, $\angle A = 90°$, $b = 9$ cm, and $c = 12$ cm. Determine the measure of $\angle B$, to the nearest degree.

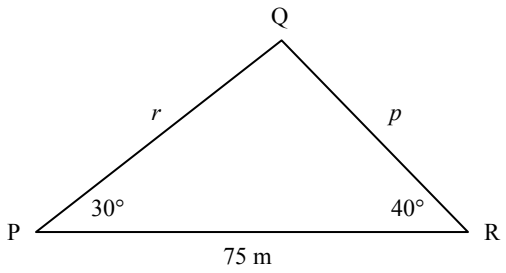
14. For a person standing at point A, the angle of elevation to the top of a building is 45°. After the person walks directly toward the building to point B, the angle of elevation increases to 70°. The building is 100 m tall.
a) Draw a diagram showing all of the above information.
b) Find the distance between points A and B, to the nearest tenth of a metre.

15. Describe the two different sets of conditions for which you would use the law of cosines to solve a triangle.

16. Two cars leave an intersection at 3 p.m. The first car travels north at 80 km/h. The second car travels northeast at 100 km/h. Determine the distance between the cars at 5 p.m., to the nearest tenth of a kilometre. Include a diagram in your solution.

17. a) Draw the graph defined by $y = 2x$.
b) Determine the angle between $y = 2x$ and the positive x-axis.

18. Solve the following triangle. Express your answers to the nearest tenth of a metre and the nearest degree.



19. On his first shot on a golf hole, Sergio hit the ball 250 yd from the tee. It came to rest 10° left of the line to the hole. After the first shot, the new distance to the hole was 50 yd.
a) Show this information on a diagram.
b) Explain why there are two possible diagrams that match the given information.
c) Determine two possible distances from the tee to the hole.

20. A cat has climbed a tree and is unable to get down. A firefighter stands 20 m south of the base of the tree, at an angle of elevation of 30°. A dog sits on the ground southeast of the base of the tree. The angle of depression from the cat to the dog is 20°.
a) Draw a diagram, showing all of the above information.
b) Determine the distance between the firefighter and the dog, to the nearest metre.

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