MCR3U - U5: Trigonometric Ratios - Practice/Review

Following are some pratice prolems intended to help you prepare for the Trig Ratios test. Use them well - Practice!

Ask for help if you need it. Extra help session after school Monday.

Solutions to these problems will be posted by Monday after 3pm. Tuesday will be a practice test.

1. A ladder is leaning against a 3.4 m tall building at an angle of elevation of 50°. Determine the length of the ladder to the nearest tenth of a metre.
   a. 3.9 m
   b. 3.0 m
   c. 4.4 m
   d. 5.3 m

2. Determine the value of θ to the nearest degree if $\cot\theta = 0.75$.
   a. 53°
   b. 37°
   c. 45°
   d. 42°

3. The hypotenuse, c, of right $\triangle ABC$ is 5.0 cm long. Given the trigonometric ratio $\cos A = 0.75$ for angle A, what is the area of the triangle to the nearest tenth of a cm^2?
   a. 5.4 cm
   b. 6.2 cm
   c. 7.3 cm
   d. 8.0 cm

4. Determine the exact value of $\tan^2 45° - \cos 30°$.
   a. $2 - \frac{\sqrt{3}}{2}$
   b. $1 + \frac{\sqrt{3}}{2}$
   c. $1 - \sqrt{3}$
   d. $\frac{2 - \sqrt{3}}{2}$

5. For the angle $\theta = 150°$ moving counter-clockwise in standard position, determine which primary trigonometric ratio is positive.
   a. sine
   b. cosine
   c. tangent
   d. none are positive

6. Use the trigonometric ratio $\sin\theta = -0.2761$ to determine which of the following is the correct value of θ to the nearest degree if $0° \le \theta \le 360°$.
   a. 164°
   b. 82°
   c. 16°
   d. 344°

7. $P(2,-3)$ lies on the terminal arm of an angle in standard position. What is the value of the principal angle θ to the nearest degree?
   a. 56°
   b. 146°
   c. 236°
   d. 304°

8. Which of the following completes the missing step to the following proof.

$\frac{\cos^2\theta}{1-\sin\theta} = 1+\sin\theta$

L.S.:

$\frac{\cos^2\theta}{1-\sin\theta}$

= ???

$= \frac{(1-\sin\theta)(1+\sin\theta)}{1-\sin\theta}$

$= 1+\sin\theta$

= R.S.

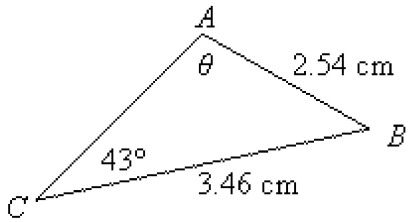
a. $\frac{1-\sin^2\theta}{1-\sin\theta}$

b. $\frac{\cos^2\theta+\sin^2\theta}{1-\sin\theta}$

c. $\frac{\cos^2\theta}{1-\sin\theta}\cdot\frac{1+\sin\theta}{1+\sin\theta}$

d. $\frac{\cos^2\theta}{1-\sin\theta}\cdot\frac{\sin^2\theta}{\sin^2\theta}$

9. Determine the measure of the angle θ to the nearest degree.



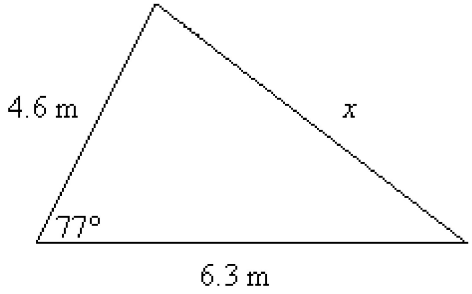
a. $\theta = 62°$

b. $\theta = 64°$

c. $\theta = 66°$

d. $\theta = 68°$

10. Determine x to the nearest tenth of a metre.



a. 7.5 m

b. 7.9 m

c. 6.2 m

d. 6.9 m

11. A woman has a triangular garden with side lengths of 10 m, 12 m, and 4 m. Determine the angle between the side lengths of 10 m and 12 m to the nearest degree.

a. 15°

b. 16°

c. 17°

d. 18°

12. If 3 sides are known for a triangle, what piece of information can be found and what method is used?

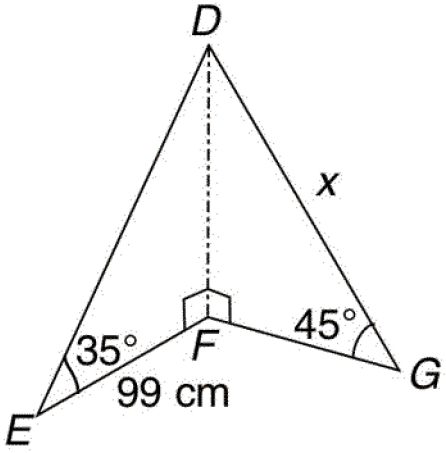
a. side, sine law

b. side, cosine law

c. angle, sine law

d. angle, cosine law

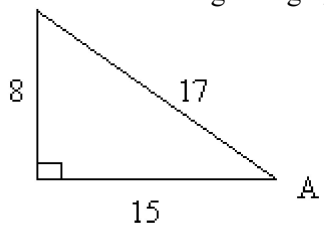
13. Determine the value of x to the nearest cm.



a. 47 cm
b. 68 cm
c. 74 cm
d. 98 cm

Full Solutions

14. Given the following triangle, state the six trigonometric ratios for $\angle A$.



15. Determine the exact value of $2\sin^2 60° \times \tan 30°$.

16. Given $\cos(\theta + 25°) = 0.2237$, solve for θ to the nearest degree. Assume θ is in quadrant 1.

17. For each question, draw the angle of roation and determine the EXACT trig ratio:
a) $\sin(150°)$ b) $\tan(-315°)$ c) $\sec(210°)$

18. Given the trig ratio determine **both possible** values for θ where $0° \le \theta \le 360°$:

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

19. Given the (inexact!!) trig ratio, determine **both possible** values for θ where $0° \le \theta \le 360°$ (round to the nearest degree):

a) $\cos(\theta) = -0.3421$ b) $\csc(\theta) = 1.512$

20. Prove the following identity.

$$1 = \frac{(\sin^4 x - \cos^4 x)}{\tan x \sin x \cos x - \cos^2 x}$$

21. Prove the following identity.

$$\tan x \sec x = \frac{\sin^3 x + \cos^2 x \sin x}{\cos^2 x}$$

22. A triangular plot of land is enclosed by a fence. One side of the fence is 8.1 m long with an opposite angle of 75°. An adjacent side of the fence is 5.7 m long with an opposite angle of θ.
    a) Make a sketch of the situation.
    b) Determine θ to the nearest degree.

23. The posts of a hockey goal are 2.0 m apart. A player attempts to score by shooting the puck along the ice from a point 7.2 m from one post and 8.6 m from the other. Within what angle θ must the shot be made? Round your answer to the nearest degree.

24. Given a triangle with 3 angles that sum to 180°, can the lengths of the sides be determined?

25. Mary stands on a balcony. Joe is on the left of the balcony looking up at her at an angle of 52° with the ground. Trent is on the right of the balcony looking up at her at an angle of 47° with the ground. If the height, h, is 4 m, how far apart are Joe and Trent standing to the nearest tenth of a metre? Assume the angle the base of the balcony makes between Joe and Trent is 90°.

26. Doug is looking at a cliff. He determines that the angle of elevation to the top is 54° from where he is at. 50 m away from Doug, Gary estimates the angle between the base of the cliff, himself, and Doug to be 26° while Doug estimates the angle between the base of the cliff, himself, and Gary to be 70°. What is the height, h, of the cliff to the nearest tenth of a metre?