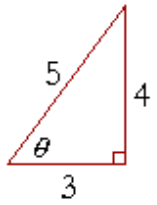
First name: _____ Last name: _____ Student ID: _____

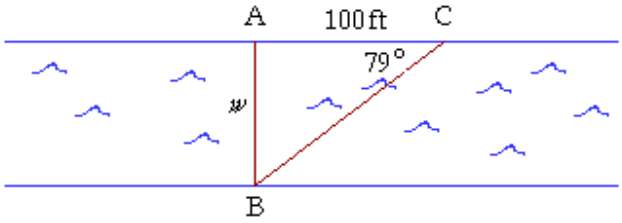
Trigonometry (1) Homework

1. The sides of a right triangle are in the ratio 3:4:5, as shown. Name and evaluate the six trigonometric functions of angle θ.



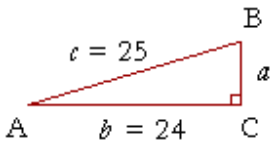
$\sin\theta =$	$\cos\theta =$
$\tan\theta =$	$\cot\theta =$
$\csc\theta =$	$sec\theta =$

2. Two trees stand opposite one another, at points A and B, on opposite banks of a river.



Distance AC along one bank is perpendicular to BA, and is measured to be 100 feet. Angle ACB is measured to be 79°. How far apart are the trees; that is, what is the width w of the river? ***Use the secondary trigonometric ratio to solve the problem.***

3. Solve the right triangle ABC given that side $c = 25$ cm and side $b = 24$ cm.



4. Determine the exact value of each trigonometric expression.

a) sin 30° x tan 60° - cos 30°

b) $\tan^2 30° - \cos^2 45°$

5. Solve for x, where $0° \le x \le 90°$.

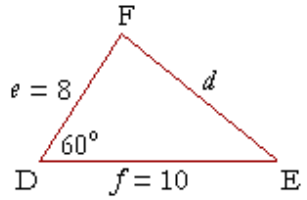
a) $2\sqrt{2}\cos x = 2$

b) $\sqrt{3}\tan x - 1 = 0$

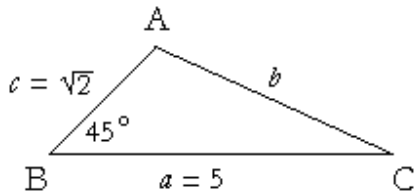
c) $2\sin(x - 10^o) - \sqrt{3} = 0$

6. Show that tan 30° + cot 30° = sec 30° csc 30°.

7. In triangle DEF, side $e = 8$ cm, $f = 10$ cm, and the angle at D is 60°. Find side d.



8. In the oblique triangle ABC, find side b if side $a = 5$ cm, $c = \sqrt{2}$ cm, and they include an angle of 45°.



9. Where appropriate, sketch all possible triangles, given each set of information.

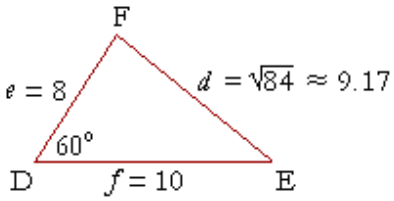
a) $a = 7.2$ mm, $b = 9.3$ mm, $\angle A = 35°$

b) $a = 7.3$ m, $b = 14.6$ m, $\angle A = 30°$

c) $a = 1.3$ cm, $b = 2.8$ cm, $\angle A = 33°$

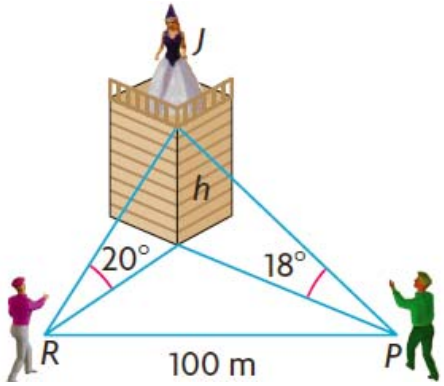
d) $c = 22.2$ cm, $\angle A = 75°, \angle B = 43°$

10. Use the Law of Sines to complete the solution of triangle DEF. That is, find angles E and F.



11. Solve the triangle given ∠B = 27°, b = 25, and a = 30.

12. Suppose Romeo is serenading Juliet while she is on her balcony. Romeo is facing north and sees the balcony at an angle of elevation of 20^o. Paris, Juliet's other suitor, is observing the situation and is facing west. Paris sees the balcony at an angle of elevation of 18^o. Romeo and Paris are 100 m apart as shown. Determine the height of Juliet's balcony above the ground, to the nearest metre.



13. Two boats left Golden Island at the same time. One boat travelled at 10 km/h on a bearing of 280^0. The other boat travelled at 13 km/h on a bearing of 165^0. How far apart were the boats after 2 hours, to the nearest kilometer?