Math 2201 Chapter 3:Acute Triangle Trigonometry Midterm Review

____ 1. Which ratios are equivalent for all three side-angle pairs in acute triangles?

a. $\dfrac{\text{length of adjacent side}}{\sin(\text{angle})}$

b. $\dfrac{\text{length of adjacent side}}{\cos(\text{angle})}$

c. $\dfrac{\cos(\text{angle})}{\text{length of opposite side}}$

d. $\dfrac{\sin(\text{angle})}{\text{length of opposite side}}$

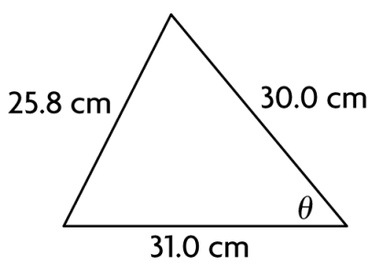
____ 2. What information do you need to know about an acute triangle to use the sine law?

a. two angles and any side
b. two sides and any angle
c. all the sides
d. all the angles

____ 3. In ΔRST, $\angle S = 54°$, $s = 91.8$ cm, and $\angle T = 64°$.
Determine the length of side t to the nearest tenth of a centimetre.

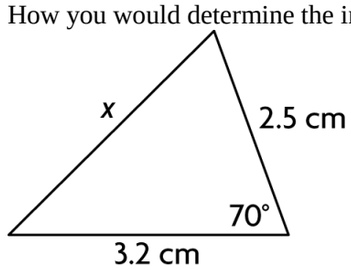
a. 102.0 cm
b. 102.6 cm
c. 102.4 cm
d. 102.2 cm

____ 4. Determine the measure of θ to the nearest degree.



a. 50°
b. 40°
c. 30°
d. 60°

____ 5. How you would determine the indicated side length, if it is possible?



a. primary trigonometric ratios
b. the sine law
c. not possible
d. the cosine law

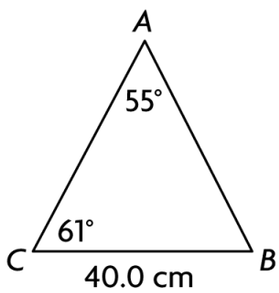
____ 6. In a parallelogram, two adjacent sides measure 20 cm and 27 cm.
The shorter diagonal is 23 cm. Determine, to the nearest degree,
the measures of the larger angles in the parallelogram.

a. 113°
b. 134°
c. 103°
d. 124°

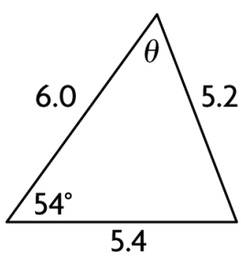
7. Sketch a triangle that corresponds to the equation.
Then, determine the third angle measure and the third side length.

$$\frac{25.0}{\sin 45°} = \frac{32.0}{\sin 65°}$$

8. Determine the length of c to the nearest tenth of a centimetre.



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

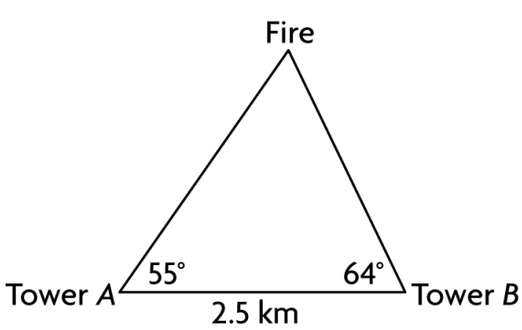


10. In ΔXYZ, $\angle X = 36°$, $x = 14.4$ cm, and $\angle Y = 70°$.
Determine the length of side y to the nearest tenth of a centimetre.

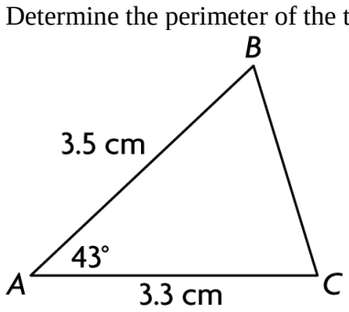
11. In ΔLMN, $l = 10.0$ cm, $m = 13.2$ cm, and $\angle M = 79°$.
Determine the measure of $\angle L$ to the nearest degree.

12. In ΔPQR, $\angle P = 55°$, $\angle Q = 77°$, and $p = 4.5$ cm.
Solve the triangle. Round angles to the nearest degree and sides to the nearest tenth of a centimetre. Show your work.

13. Two Jasper National Park rangers in their fire towers spot a fire.
Determine the distances, to the nearest tenth of a kilometre, from each tower to the fire. Show your work.



14. Determine the perimeter of the triangle to the nearest tenth of a centimetre.

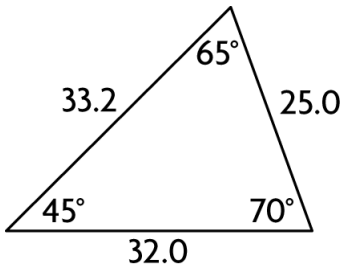


MULTIPLE CHOICE

1. ANS: D
2. ANS: A
3. ANS: A
4. ANS: A
5. ANS: D
6. ANS: D

SHORT ANSWER

7. ANS:



70°, 33.2

8. ANS:
c = 42.7 cm

9. ANS:
θ = 57°

10. ANS:
c = 23.0 cm

11. ANS:
$\angle L$ = 48°

PROBLEM

12. ANS:

$$\angle P + \angle Q + \angle R = 180°$$
$$55° + 77° + \angle R = 180°$$
$$\angle R = 48°$$

$$\frac{r}{\sin R} = \frac{p}{\sin P}$$

$$\frac{r}{\sin 48°} = \frac{4.5}{\sin 55°}$$

$$\sin 48°\left(\frac{r}{\sin 48°}\right) = \sin 48°\left(\frac{4.5}{\sin 55°}\right)$$

$$r = 4.082\ldots$$

The length of r is 4.1 cm.

$$\frac{q}{\sin Q} = \frac{p}{\sin P}$$

$$\frac{q}{\sin 77°} = \frac{4.5}{\sin 55°}$$

$$\sin 77°\left(\frac{q}{\sin 77°}\right) = \sin 77°\left(\frac{4.5}{\sin 55°}\right)$$

$$q = 5.352\ldots$$

The length of q is 5.4 cm.

13. ANS:

Let $\angle C$ represent the measure of the remaining unknown angle.

$$\angle A + \angle B + \angle C = 180°$$
$$55° + 64° + \angle C = 180°$$
$$\angle C = 61°$$

Let b represent the distance from tower A to the fire.

$$\frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{b}{\sin 64°} = \frac{2.5}{\sin 61°}$$

$$b = \sin 64°\left(\frac{2.5}{\sin 61°}\right)$$

$$b = 2.569\ldots$$

The distance from tower A to the fire is 2.6 km.

Let a represent the distance from tower B to the fire.

$$\frac{a}{\sin A} = \frac{c}{\sin C}$$

$$\frac{a}{\sin 55°} = \frac{2.5}{\sin 61°}$$

$$a = \sin 55°\left(\frac{2.5}{\sin 61°}\right)$$

$$a = 2.341\ldots$$

The distance from tower B to the fire is 2.3 km.

14. ANS:

$$a^2 = b^2 + c^2 - 2bc \cos A$$
$$a^2 = 3.3^2 + 3.5^2 - 2(3.3)(3.5) \cos 43°$$
$$a^2 = 10.89 + 12.25 - 23.10(0.7313...)$$
$$a^2 = 6.245...$$
$$a = 2.499...$$

Perimeter = $a + b + c$

Perimeter = 2.499... + 3.3 + 3.5

Perimeter = 9.299...

The perimeter of the triangle is 9.3 cm.