

Math 11

Trigonometry Exam Review

1. The area of a triangular flower bed is 200m^2 . Two of the sides are 20m and 35m . What is the measure of the included angle?

$$A = \frac{1}{2} bc \sin A$$

$$200\text{m}^2 = \frac{1}{2} (20\text{m})(35\text{m}) \sin A$$

$$200\text{m}^2 = \frac{1}{2} (700\text{m}^2) \sin A$$

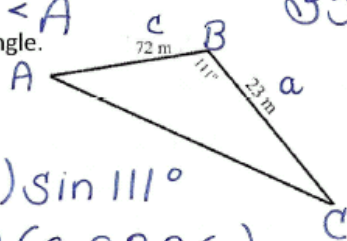
$$\frac{200\text{m}^2}{350\text{m}^2} = \frac{350\text{m}^2 \sin A}{350\text{m}^2}$$

$$0.5714 = \sin A$$

$$\sin^{-1}(0.5714) = \angle A$$

$$35^\circ = \angle A$$

2. Find the area of the following triangle.



$$A = \frac{1}{2} ac \sin B$$

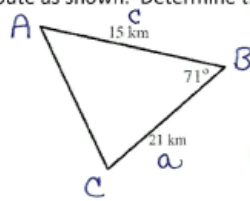
$$A = \frac{1}{2} (23\text{m})(72\text{m}) \sin 111^\circ$$

$$A = \frac{1}{2} (1656\text{m}^2) (0.93336)$$

$$A = \frac{1}{2} (1546.0092\text{m}^2)$$

$$A = 773.0\text{m}^2$$

3. A bus travels the following route as shown. Determine the area it covers to the nearest 10km^2 .



$$A = \frac{1}{2} ac \sin B$$

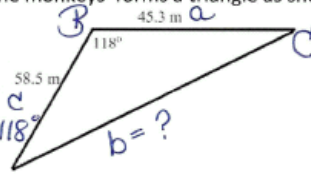
$$A = \frac{1}{2} (21\text{ km})(15\text{ km}) \sin 71^\circ$$

$$A = \frac{1}{2} (315\text{ km}^2)(0.9455)$$

$$A = \frac{1}{2} (297.8325\text{ km}^2)$$

$$A = 148.92\text{ km}^2$$

4. The boundaries for a zoo exhibit which houses the monkeys forms a triangle as shown. Determine the length of the third side to the nearest tenth of a meter.



$$b^2 = a^2 + c^2 - 2ac \cos B$$

$$b^2 = (45.3)^2 + (58.5)^2 - 2(45.3)(58.5) \cos 118^\circ$$

$$b^2 = 2052.09 + 3422.25 - 5300.1(-0.4695)$$

$$b^2 = 5474.34 + 2488.35$$

$$b^2 = 7962.69$$

$$b = \sqrt{7962.69}$$

$$b = 89.2\text{ m}$$

5. A sign is supported from the side of a building by two steel struts, as shown below. Find the length of the struts from the information given in the diagram.

$$\angle B = 180^\circ - 43^\circ - 71^\circ$$

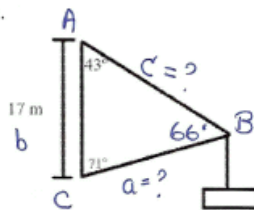
$$\angle B = 66^\circ$$

$$\frac{a}{\sin A} = \frac{b}{\sin B}$$

$$\frac{a}{\sin 43^\circ} = \frac{17}{\sin 66^\circ}$$

$$a \sin 66^\circ = \frac{17 \sin 43^\circ}{\sin 66^\circ}$$

$$a = 12.7 \text{ m}$$



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

$$\frac{c}{\sin 71^\circ} = \frac{17}{\sin 66^\circ}$$

$$c \frac{\sin 66^\circ}{\sin 66^\circ} = \frac{17 \sin 71^\circ}{\sin 66^\circ}$$

$$c = 17.6 \text{ m}$$

6. During basketball practice the players performed the following drill. Player B threw the ball to player A, who directed it through an angle of 58° to player C as show in the diagram below. To the nearest degree determine the measure of the acute angle θ in the diagram.

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

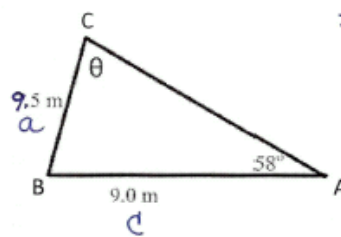
$$\frac{\sin C}{9.0\text{m}} = \frac{\sin 58^\circ}{9.5\text{m}}$$

$$\frac{\cancel{9.5} \sin C}{\cancel{9.5}} = \frac{9.0 \sin 58^\circ}{9.5}$$

$$\sin C = 0.8034$$

$$C = \sin^{-1}(0.8034)$$

$$C = 53^\circ$$



* Change
7.5 to 9.5!

7. A lightning rod is anchored to the ground at point A, 76.8 m from the building at point C, as shown in the following diagram. Find the length of the cable AB to the nearest meter.

$$\angle C = 180^\circ - 60^\circ - 50^\circ \quad \underline{\text{OR}} \quad \angle C = 180^\circ - 110^\circ \\ = 70^\circ \qquad \qquad \qquad = 70^\circ$$

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

$$\frac{c}{\sin 70^\circ} = \frac{76.8 \text{ m}}{\sin 60^\circ}$$

$$\frac{c \sin 60^\circ}{\sin 60^\circ} = \frac{76.8 \sin 70^\circ}{\sin 60^\circ}$$

$$c = \frac{76.8 (0.9397)}{0.8660}$$

$$c = 83.3 \text{ m}$$

