Math 11

Trigonometry Exam Review

1. The area of a triangular flower bed is 200m². Two of the sides are 20m and 35m. What is the measure of the included angle?

$$A = \tfrac{1}{2}\, bc \sin A$$
$$200m^2 = \tfrac{1}{2}(20m)(35m)\sin A$$
$$200m^2 = \tfrac{1}{2}(700m^2)\sin A$$
$$\frac{200\,m^2}{350\,m^2} = \frac{350m^2 \sin A}{350m^2}$$
$$0.5714 = \sin A$$
$$\sin^{-1}(0.5714) = <A \qquad 35° = <A$$
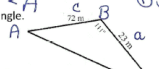
2. Find the area of the following triangle.

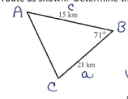$$A = \tfrac{1}{2}\, ac \sin B$$
$$A = \tfrac{1}{2}(23m)(72m)\sin 111°$$
$$A = \tfrac{1}{2}(1656m^2)(0.9336)$$
$$A = \tfrac{1}{2}(1546.0092\,m^2)$$
$$A = 773.0\ m^2$$

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3. A bus travels the following route as shown. Determine the area it covers to the nearest 10km².
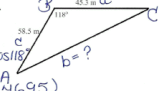
$$A = \tfrac{1}{2}\, ac \sin B$$
$$A = \tfrac{1}{2}(21Km)(15Km)\sin 71°$$
$$A = \tfrac{1}{2}(315\ Km^2)(0.9455)$$
$$A = \tfrac{1}{2}(297.8325\ Km^2)$$
$$A = 148.92\ Km^2$$

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.

$$b^2 = a^2 + c^2 - 2ac \cos B$$
$$b^2 = (45.3)^2 + (58.5)^2 - 2(45.3)(585)\cos 118$$
$$b^2 = 2052.09 + 3422.25 - 5300.1(-0.4695)$$
$$b^2 = 5474.34 + 2488.35$$
$$b^2 = 7962.69$$
$$b = \sqrt{7962.69}$$
$$b = 89.2\ m$$

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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.

$$<B = 180° - 43° - 71°$$
$$<B = 66°$$

$$\frac{a}{\sin A} = \frac{b}{\sin B}$$
$$\frac{a}{\sin 43°} = \frac{17}{\sin 66°}$$
$$\frac{a \sin 66°}{\sin 66°} = \frac{17 \sin 43°}{\sin 66°}$$
$$a = 12.7\ m$$
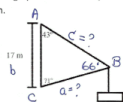
$$\frac{c}{\sin C} = \frac{b}{\sin B}$$
$$\frac{c}{\sin 71'} = \frac{17}{\sin 66°}$$
$$\frac{c \sin 66°}{\sin 66°} = \frac{17 \sin 71°}{\sin 66°}$$
$$c = 17.6\ m$$

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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.
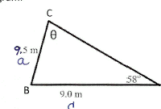
$$\frac{\sin C}{c} = \frac{\sin A}{a}$$
$$\frac{\sin C}{9.0m} = \frac{\sin 58°}{9.5m}$$
$$\frac{9.5 \sin C}{9.5} = \frac{9.0 \sin 58°}{9.5}$$
$$\sin C = 0.8034$$
$$C = \sin^{-1}(0.8034)$$
$$C = 53°$$

✱ Change 7.5 to 9.5!

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7. A lightening 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.

$$<C = 180° - 60° - 50° \quad \underline{OR} \quad <C = 180° - 110°$$
$$= 70° \qquad\qquad\qquad = 70°$$

$$\frac{c}{\sin C} = \frac{b}{\sin B}$$
$$\frac{c}{\sin 70°} = \frac{76.8m}{\sin 60°}$$
$$\frac{c \sin 60°}{\sin 60°} = \frac{76.8 \sin 70°}{\sin 60°}$$
$$c = \frac{76.8(0.9397)}{0.8660}$$
$$c = 83.3\ m$$

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