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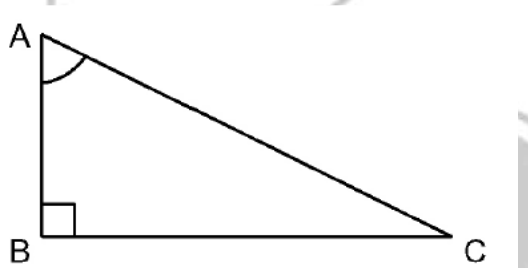
CHAPTER 1 REVIEW

1.1 – REVISIT THE PRIMARY TRIGONOMETRIC RATIOS

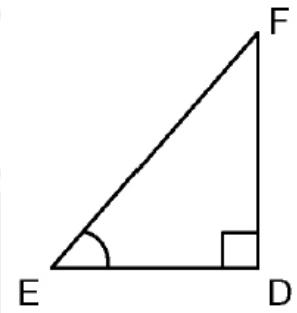
$$\sin = \frac{OPPOSITE}{HYPOTENUSE} \qquad \cos = \frac{ADJACENT}{HYPOTENUSE} \qquad \tan = \frac{OPPOSITE}{ADJACENT}$$

1. Name the sides that form the indicated angle

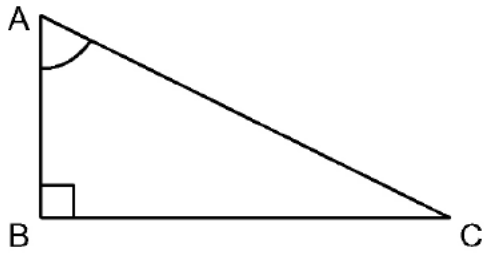
(a) $\angle$ A



(b) $\angle$E



(c) $\angle$ A



2. Evaluate the following to <u>three decimal places</u>

(a) sin 45° = _____ (b) cos 60° = _____

(c) tan 30° = _____

3. Determine the angle measure of each angle to the <u>nearest whole number</u>. First one is done for you

(a) $\sin A = 0.8356$

$\angle A = \sin^{-1}(0.8356)$

$\angle A = 57°$

(b) cos B = 0.2457 (c) tan C = 1.8659

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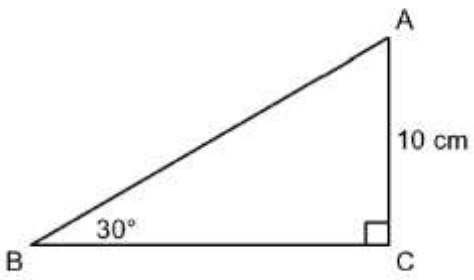
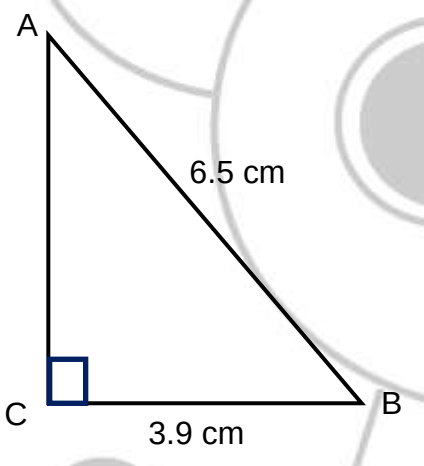
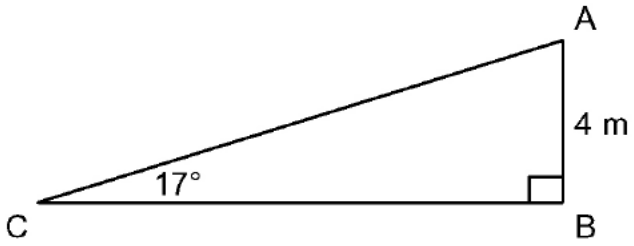
4. Use basic trigonometric ratios to solve for side **BC**. Express your answer to <u>one decimal place</u>



5. Use trigonometric ratios to determine the angle measures of both ∠**A** and ∠**B**



6. Use trigonometric ratios to solve for side **AC**. Express your answer to <u>one decimal place</u>



7. A ladder is resting against a wall. The foot of the ladder is **2 m** from the base of the wall. The ladder forms a **48°** angle between ground and the ladder. How far up the wall does the ladder reach? Express your answer to <u>one decimal place</u>

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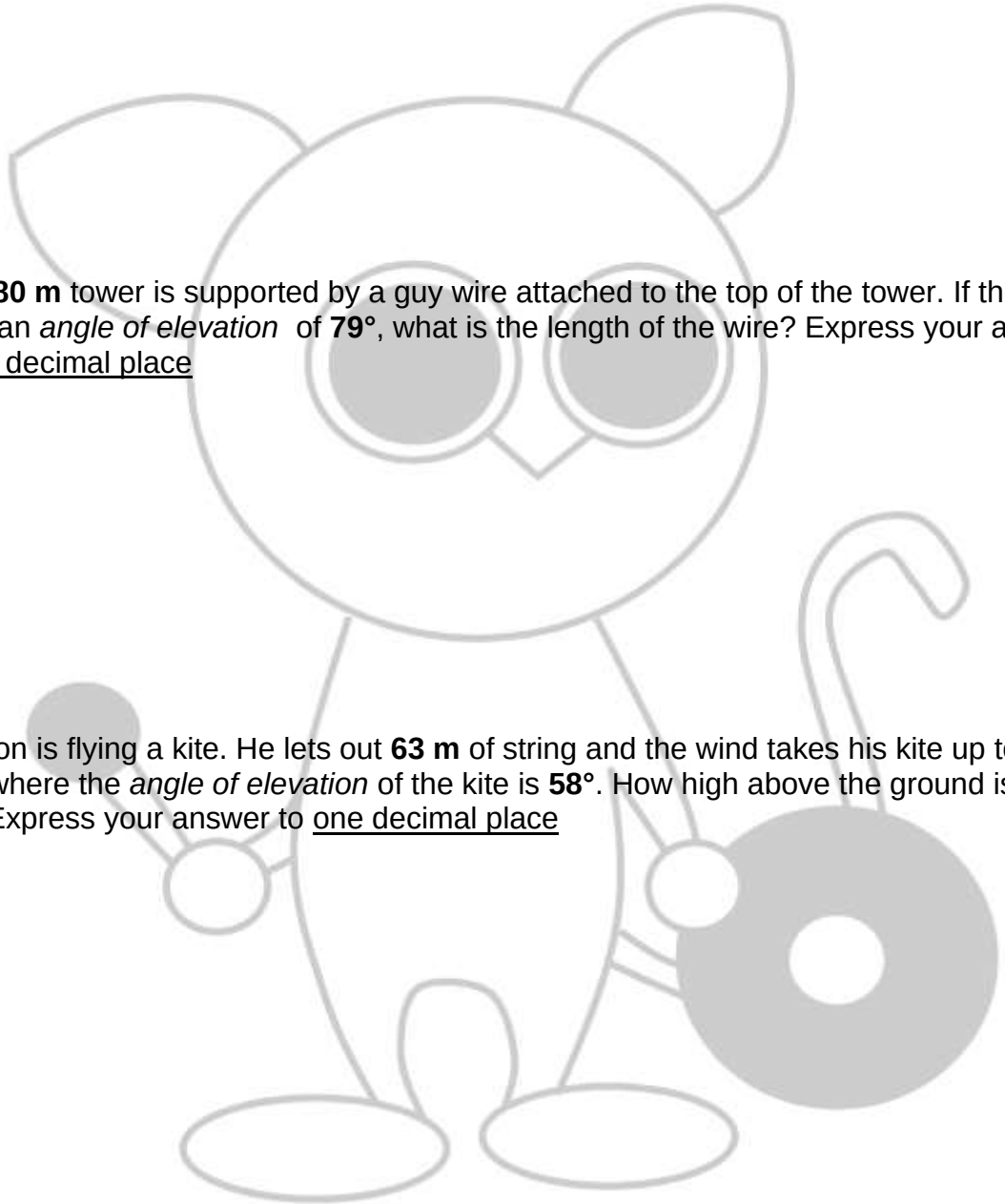
1.2 – SOLVE PROBLEMS USING TRIGONOMETRIC RATIOS

1. A **5 m** ladder is resting against a wall. The foot of the ladder is **2 m** away from the base of the wall. At **what angle** does the bottom of ladder make with the ground? Express your answer to the nearest whole number



2. An **80 m** tower is supported by a guy wire attached to the top of the tower. If the wire forms an *angle of elevation* of **79°**, what is the length of the wire? Express your answer to one decimal place

3. Jason is flying a kite. He lets out **63 m** of string and the wind takes his kite up to a point where the *angle of elevation* of the kite is **58°**. How high above the ground is the kite? Express your answer to one decimal place

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4. Michael stands **10 m** from the base of a building. He measures the *angle of elevation* to the top of the building to be **65°**. Determine the height of the building if Michael's measurement was made from **1.5 m** above the ground. Express your answer to <u>one decimal place</u>

5. Two buildings are **60 m** apart. The *angle of depression* from the top of the taller building to the top of the shorter building is **15°**. The height of the shorter building is **30.4 m**. Determine the height of building. Express your answer to <u>one decimal place</u>

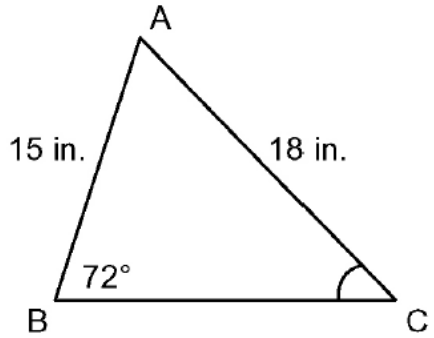
1.3 – THE SINE LAW

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

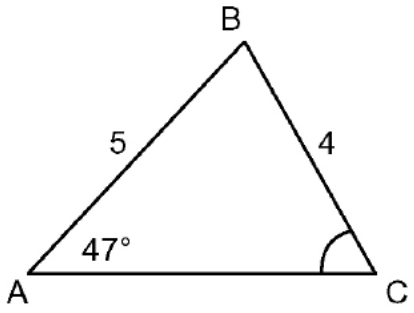
1. How do you know when to use the **Sine Law**?

2. Using the *Sine Law*, calculate the measure of $\angle$**C** for each triangle. Express your answer to the <u>nearest whole number</u>

(a)



(b)



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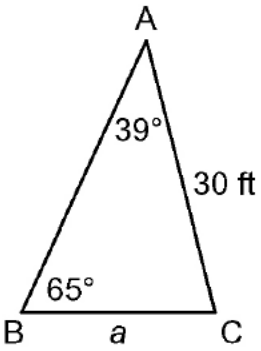
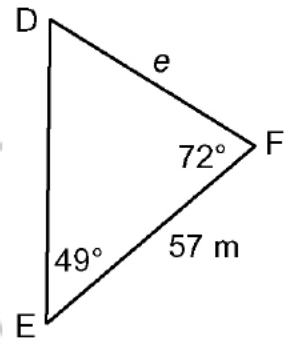
3. Determine the measure of the indicated side and express your answer to <u>one decimal place</u>

(a)

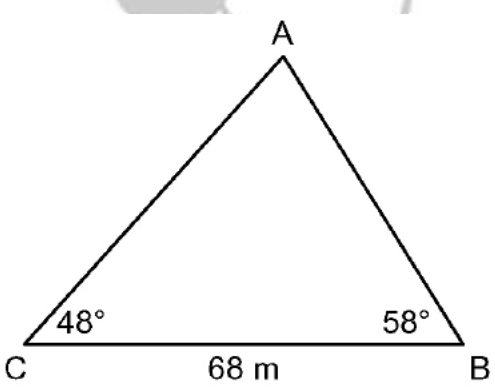


(b)



4. Given $\triangle ABC$, $\angle$**A = 72°**, **a = 15 cm** and **b = 8 cm**, determine the remaining angles and side

5. Determine the length of side **AB** and express your answer to <u>one decimal place</u>



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1.4 – THE COSINE LAW

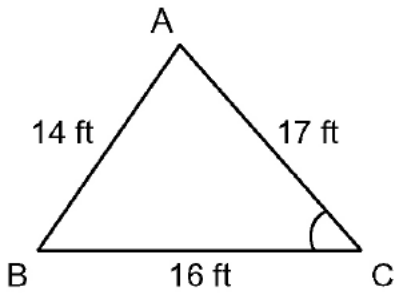
$$a^2 = b^2 + c^2 - 2bc\cos A \qquad \cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

$$b^2 = a^2 + c^2 - 2ac\cos B \qquad \cos B = \frac{a^2 + c^2 - b^2}{2ac}$$

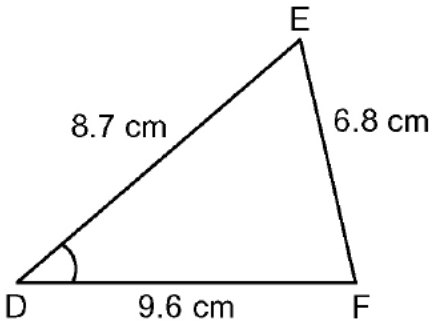
$$c^2 = a^2 + b^2 - 2ab\cos C \qquad \cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

1. Calculate the measure of the marked angle. Express your answer to the nearest whole number

(a) ∠C

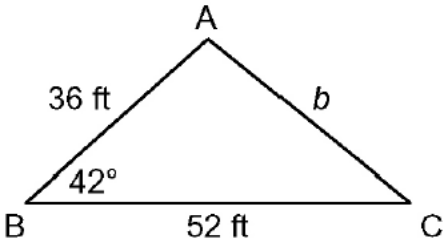


(b) ∠D

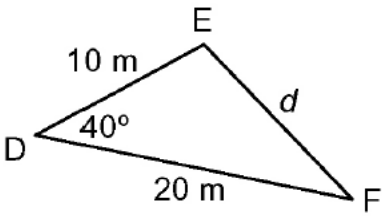


2. Determine the measure of the unknown side. Express your answer to one decimal place

(a)



(b)



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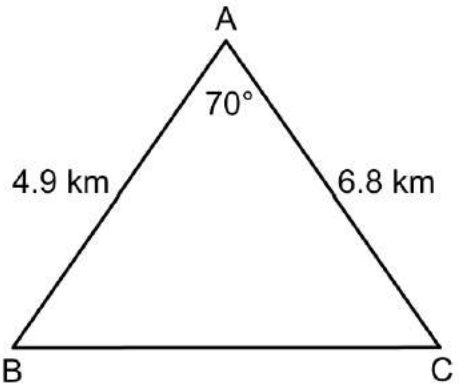
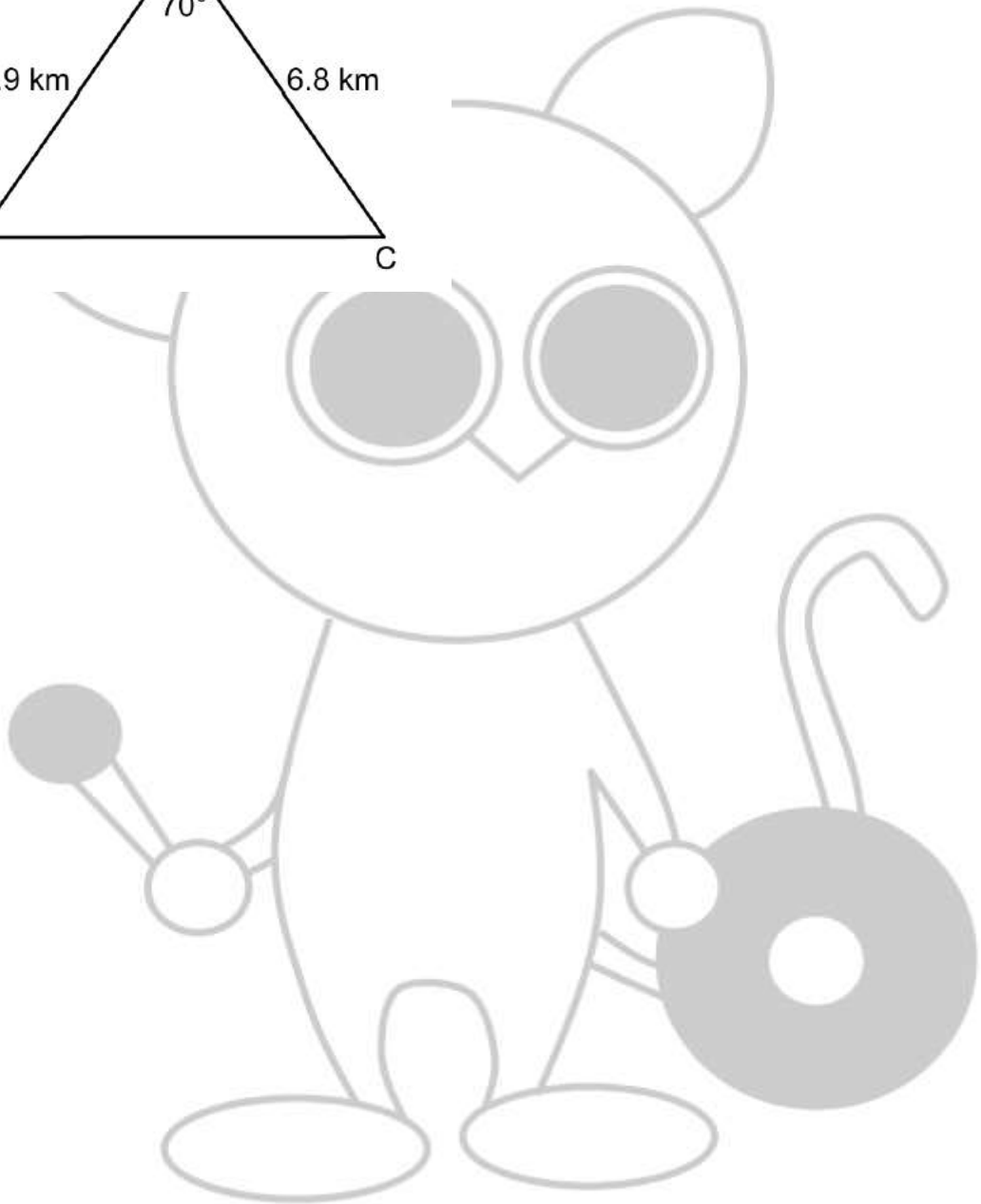
3. A radar station located at point A is tracking ships at Points B and C. How far apart are the two ships? Express your answer to <u>one decimal place</u>





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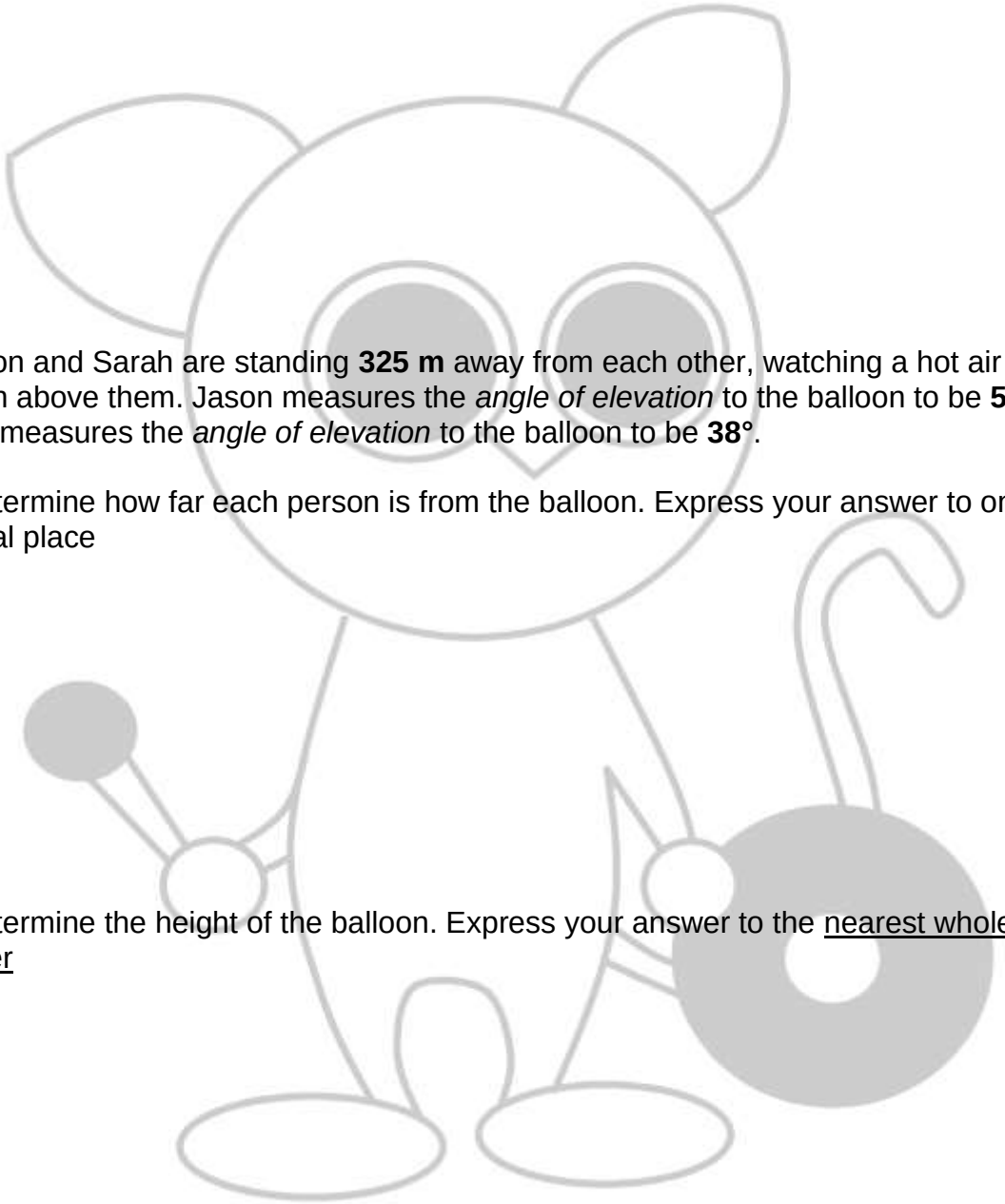
1.5 – MAKE DECISIONS USING TRIGONOMETRY

1. A ferry is used to transport guests from the dock to two hotels across a large lake. The hotels are located **550 m** apart. The first hotel is at a **49° angle** between the dock and second hotel. The second hotel is at a **56° angle** between the dock and the first hotel. How far is each hotel from the dock?



2. Jason and Sarah are standing **325 m** away from each other, watching a hot air balloon above them. Jason measures the *angle of elevation* to the balloon to be **54°**. Sarah measures the *angle of elevation* to the balloon to be **38°**.

(a) Determine how far each person is from the balloon. Express your answer to one decimal place

(b) Determine the height of the balloon. Express your answer to the <u>nearest whole number</u>

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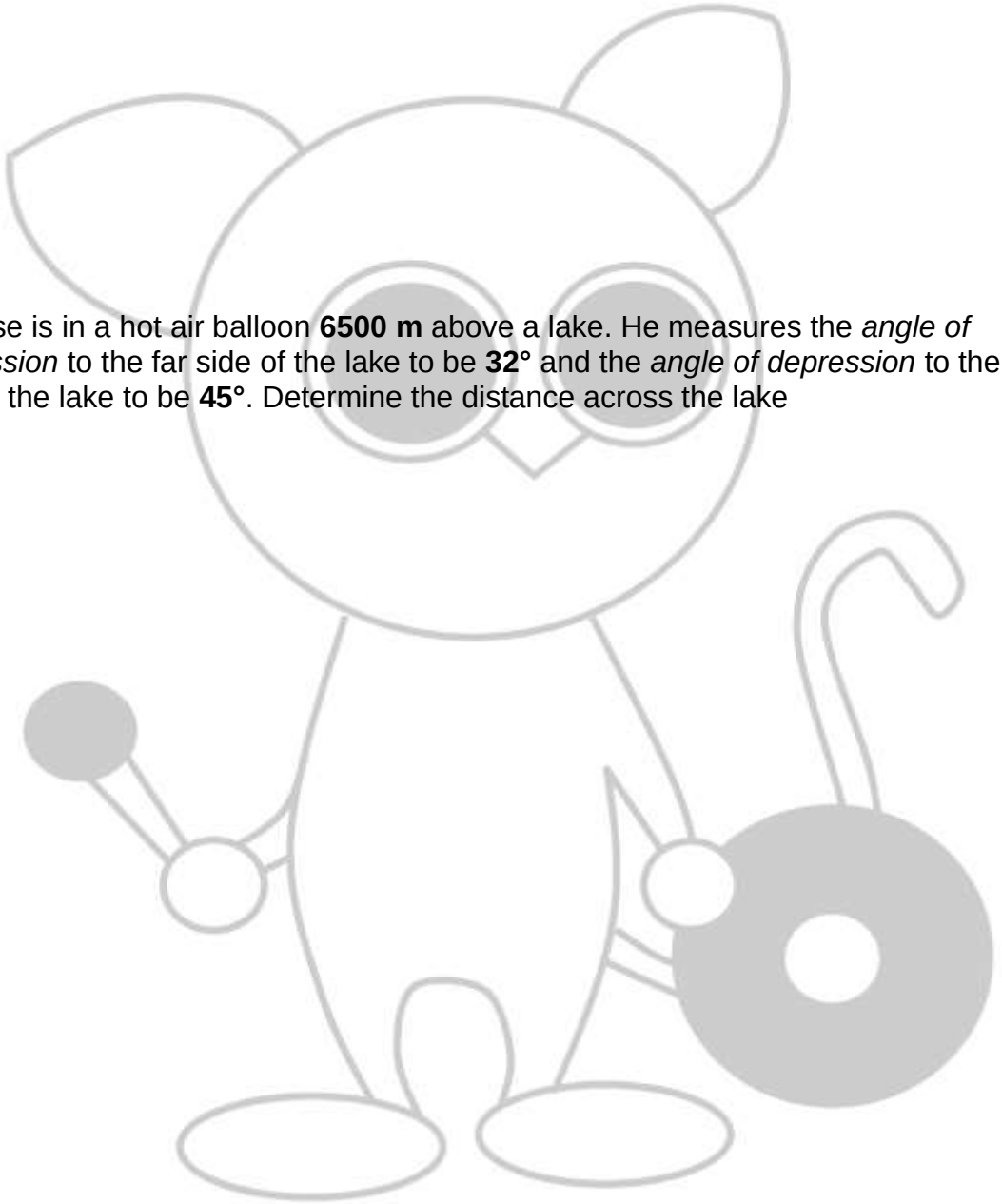
3. A funnel used to pour oil into an engine in in the shape of a cone. The sides of the cone are **15 cm** long and the angle between the sides is **17.9°**. Calculate the diameter of the cone. Express your answer to <u>one decimal place</u>



4. Jesse is in a hot air balloon **6500 m** above a lake. He measures the *angle of depression* to the far side of the lake to be **32°** and the *angle of depression* to the near side of the lake to be **45°**. Determine the distance across the lake

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SOLUTIONS

1.1

2. (a) 0.7071 (b) 0.5 (c) 0.5774

3. (b) 76° (c) 62°

4. 17.3 m

5. $\angle A = 37°$, $\angle B = 53°$

6. 13.7 m

7. 2.2 m

1.2

1. 66° 2. 81.5 m 3. 53.4 m 4. 22.9 m 5. 46.5 m

1.3

2. (a) 52° (b) 66°

3. (a) 20.8 ft (b) 50.2 m

4. $\angle C = 78°$, $\angle B = 30°$, c = 15 cm

5. 52.6 cm

1.4

1. (a) 50° (b) 43°

2. (a) 34.9 ft (b) 13.9 m

3. 6.9 km

1.5

1. 1st hotel = 472 m, 2nd hotel = 430 m

2. (a) Jason = 118 m, Sarah = 207 m
   (b) 162 m

3. 4.7 cm

4. 16902 m

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