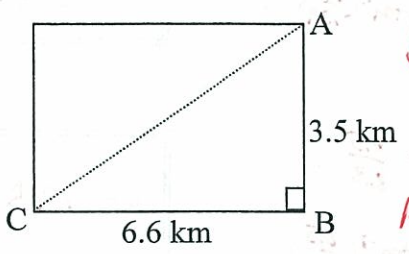


Math 10 Pure
Trigonometry Hand-In Assignment

For the following questions, show ALL work, then write your answer in the box provided, including the correct units.

- 1. Calculate how much shorter path AC is than walking along path AB and then along path BC. Round your answer to the nearest tenth. [3 marks]



$$AC^2 = 6.6^2 + 3.5^2$$

$$\sqrt{AC^2} = \sqrt{55.8}$$

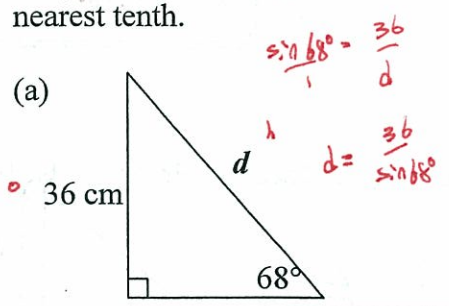
$$AC = 7.47 \text{ km}$$

$$AB + BC = 6.6 + 3.5 = 10.1$$

$$10.1 - 7.47 = 2.6$$

ANSWER: 2.6 km

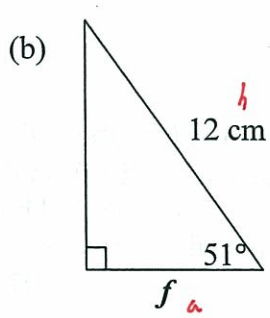
- 2. Calculate the missing side for each of the following triangles. Round your answers to the nearest tenth. [4 marks]



$$\sin 68^\circ = \frac{36}{d}$$

$$d = \frac{36}{\sin 68^\circ}$$

d: 38.8 cm

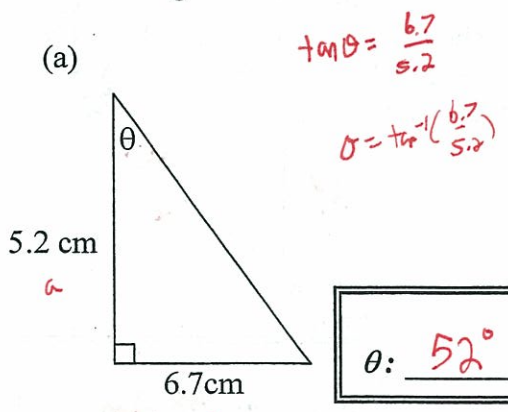


$$\cos 51^\circ = \frac{f}{12}$$

$$f = \cos(51^\circ) \times 12$$

f: 7.6 cm

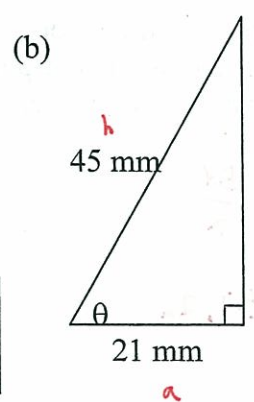
- 3. Solve for the missing angle in each of the following triangles. Round your answers to the nearest degree. [2 marks]



$$\tan \theta = \frac{6.7}{5.2}$$

$$\theta = \tan^{-1}\left(\frac{6.7}{5.2}\right)$$

theta: 52 degrees



$$\cos \theta = \frac{21}{45}$$

$$\theta = \cos^{-1}\left(\frac{21}{45}\right)$$

theta: 62 degrees

4. Given the following triangles, solve for all missing sides and/or angles. Round all lengths to the nearest tenth and all angles to the nearest degree. **[6 marks]**

(a)

Handwritten calculations:

$$\tan 53^\circ = \frac{r}{12}$$

$$r = 15.9$$

$$t^2 = 12^2 + 15.9^2$$

$$\sqrt{t^2} = \sqrt{472.6}$$

$$t = 19.9$$

$$\tan S = \frac{12}{15.9}$$

$$S = \tan^{-1}\left(\frac{12}{15.9}\right)$$

$$S = 37^\circ$$

$r = \underline{15.9}$
 $t = \underline{19.9}$
 $\angle S = \underline{37^\circ}$

(b)

Handwritten calculations:

$$y^2 = 6.5^2 + 8.3^2$$

$$\sqrt{y^2} = \sqrt{111.14}$$

$$y = 10.5$$

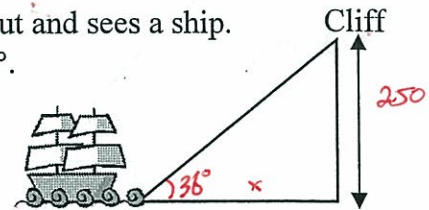
$$\tan X = \frac{6.5}{8.3}$$

$$X = \tan^{-1}\left(\frac{6.5}{8.3}\right)$$

$$X = 38^\circ$$

$y = \underline{10.5}$
 $\angle X = \underline{38^\circ}$
 $\angle Z = \underline{52^\circ}$

5. A person standing on top of a cliff 250 m above the sea looks out and sees a ship. The angle of elevation to the top of the cliff from the ship is 36° . **Complete the diagram below** and use it to find how far it is from the ship to the bottom of the cliff. Express your answer to the nearest metre. **[2 marks]**



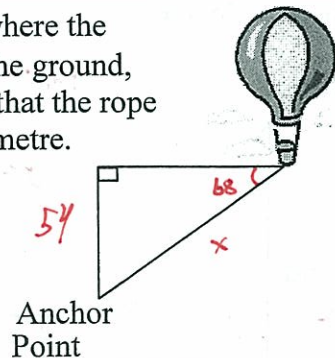
Handwritten calculations:

$$\tan 36^\circ = \frac{250}{x}$$

$$x = 344.1$$

ANSWER: 344.1 m

6. From the basket of a hot air balloon, the angle of depression to where the balloon is anchored is 68° . If the hot air balloon is 54 m above the ground, how long is the rope connecting it to the anchor point? Assume that the rope line is straight and express your answer to the nearest tenth of a metre. **[2 marks]**



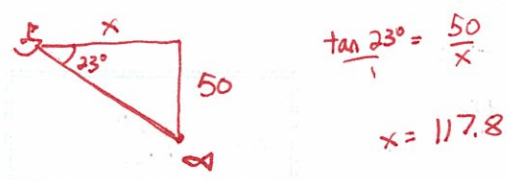
Handwritten calculations:

$$\sin 68^\circ = \frac{54}{x}$$

$$x = 58.2 \text{ m}$$

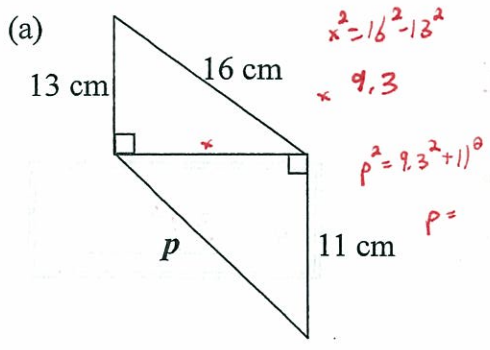
ANSWER: 58.2 m

7. A fishing captain detects a school of fish at a depth of 50m. If the angle of depression from the captain to the fish is 23° , what horizontal distance, to the nearest tenth of a metre, is the ship from the school of fish? (Draw and label a diagram) [3 marks]

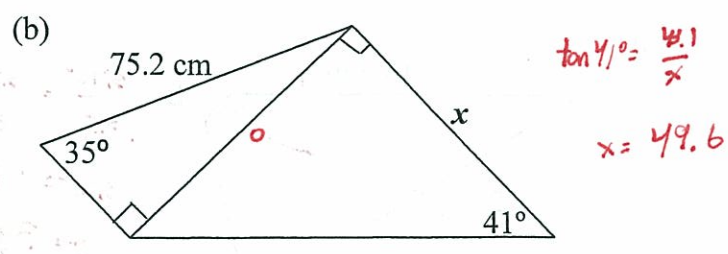


ANSWER: 117.8

8. Solve for the missing variable, rounding all answers to the nearest tenth. [4 marks]

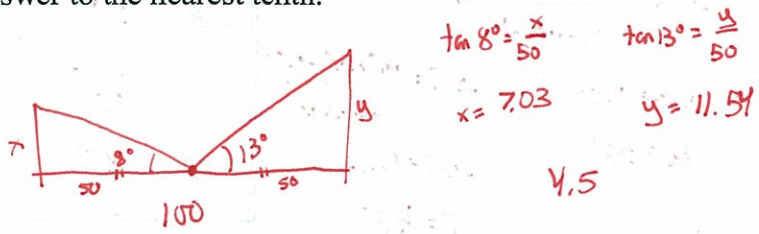


p: 14.4



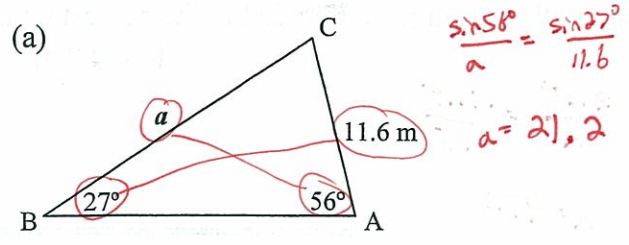
x: 49.6

9. Two trees are 100m apart. From a point halfway between the trees, the angle of elevation to the top of the shorter tree is 8° and the angle of elevation to the top of the taller tree is 13° . How much taller is the one tree than the other? Draw and label a diagram. Round your answer to the nearest tenth. [3 marks]

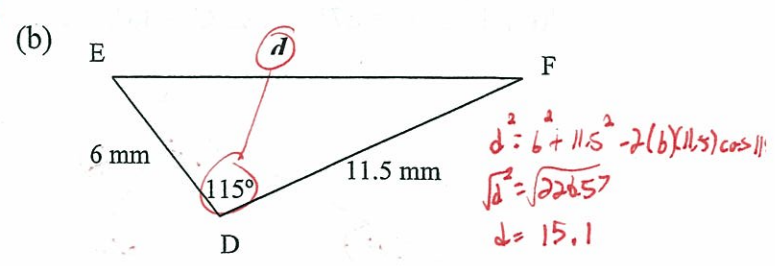


ANSWER: 4.5

10. Solve for the missing variable, rounding to the nearest tenth. [4 marks]



a: 21.2

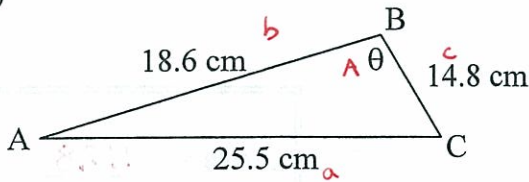


d: 15.1

11. Solve for the missing angle, to the nearest degree, in each of the following triangles.

[4 marks]

(a)



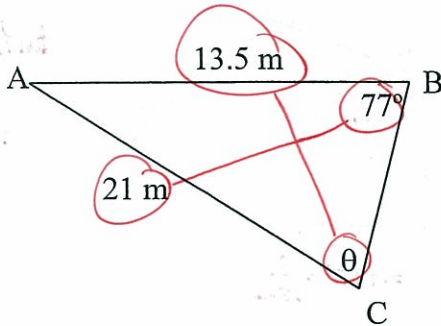
$$\cos \theta = \frac{18.6^2 + 14.8^2 - 25.5^2}{2(18.6)(14.8)}$$

$$\cos \theta = -0.15$$

$$\theta = 99^\circ$$

$\theta: \underline{99^\circ}$

(b)



$$\frac{\sin \theta}{13.5} = \frac{\sin 77^\circ}{21}$$

$$\sin \theta = 0.626$$

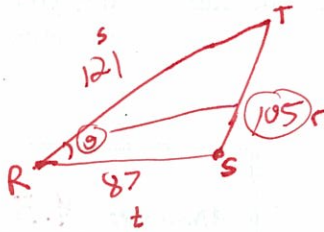
$$\theta = 39^\circ$$

$\theta: \underline{39^\circ}$

12. Draw the following triangle and solve for all missing sides, rounded to the nearest tenth, and angles, rounded to the nearest degree.

[4 marks]

Triangle RST; Given $r = 105$ km, $s = 121$ km, $t = 87$ km



$$\cos B = \frac{121^2 + 87^2 - 105^2}{2(121)(87)}$$

$$\cos B = 0.53$$

$$B = 58^\circ$$

$$\cos T = \frac{121^2 + 105^2 - 87^2}{2(121)(105)}$$

$$\cos T = 0.712$$

$$T = 45^\circ$$

$$180^\circ - 58^\circ - 45^\circ = 77^\circ$$

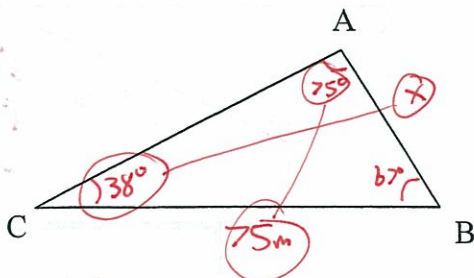
$$\angle R = \underline{58^\circ}$$

$$\angle S = \underline{77^\circ}$$

$$\angle T = \underline{45^\circ}$$

13. A bridge, from point A to point B, is to be built across a river. A point C is located 75.0 m from B, $\angle B = 67^\circ$, and $\angle C = 38^\circ$. How long will the bridge be rounded to the nearest tenth?

[3 marks]



$$\frac{\sin 38^\circ}{x} = \frac{\sin 75^\circ}{75}$$

$$x = 47.8$$

ANSWER: 47.8