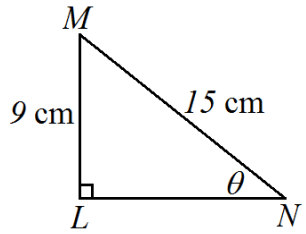
2018 Year 10 math topic test: Trigonometry

Q1 Consider ΔLMN shown below. The diagram is not drawn to scale. The length of side LM is 9 cm, and the length of side MN is 15 cm.



a. Calculate the value of $\sin\theta$. 1 mark

b. Calculate the value of $\cos\theta$. 2 marks

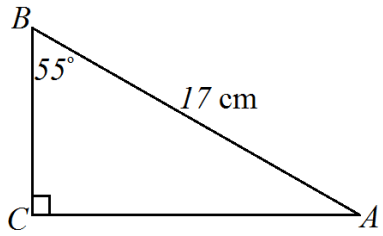
c. Calculate the value of $\tan\theta$. 1 mark

d. Determine the value of θ in degrees and minutes. Correct your answer to the nearest minute. 2 marks

e. State the value of $\sin(\angle MLN)$. 1 mark

f. State the value of $\cos(\angle MLN)$. 1 mark

Q2 Consider ΔABC shown below. The diagram is not drawn to scale. The length of side BA is 17 cm.



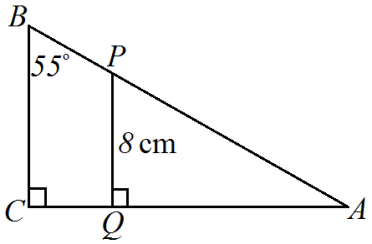
a. Determine the numerical value (correct to 2 decimal places) of the length ratio $CA : CB$. 2 marks

b. Determine the numerical value (correct to 2 decimal places) of the length ratio $CB : BA$. 2 marks

c. Calculate the length of side CB, correct to 2 decimal places. 2 marks

d. Calculate the length of side CA, correct to 2 decimal places. 2 marks

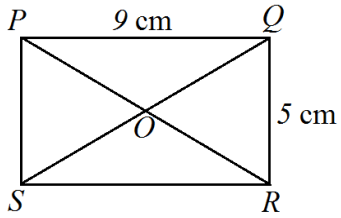
A smaller triangle labelled as ΔAPQ is constructed as shown in the following diagram.
ΔABC and ΔAPQ share the same vertex, A. The length of side PQ is 8 cm.



e. Determine the numerical value (correct to 2 decimal places) of the length ratio $QP : PA$. 2 marks

f. Calculate the length of side QA, correct to 2 decimal places. 2 marks

Q3 Rectangle $PQRS$ is shown in the following diagram. The diagram is not drawn to scale. The length of side PQ is 9 cm, and the length of side QR is 5 cm. Diagonals PR and QS intersect at point O.



a. Calculate the total length of OP and OQ, correct to 2 decimal places. 2 marks

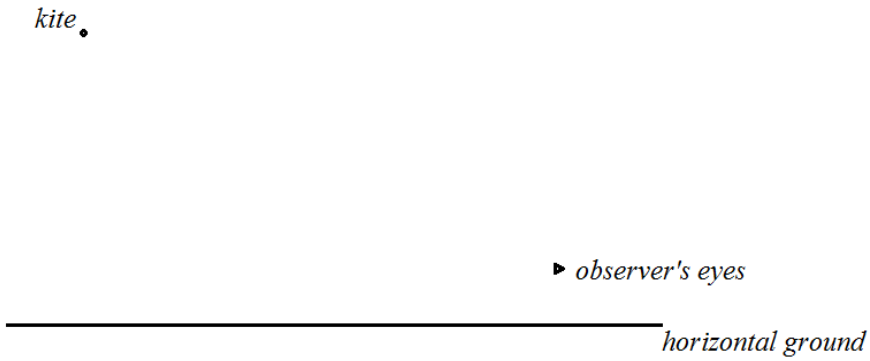
b. Calculate the size of the obtuse angle formed by the two diagonals in degrees and minutes. Correct your answer to the nearest minute.

3 marks

Q4 A kite is flying at a vertical distance of 20 m from the ground. The kite is 30 m from the observer's eyes in a straight line. The observer's eyes are 1.5 m above the ground.

a. Draw three straight lines on the diagram below to show the position of the kite relative to the observer's eyes. Write down the measurement next to each straight line.

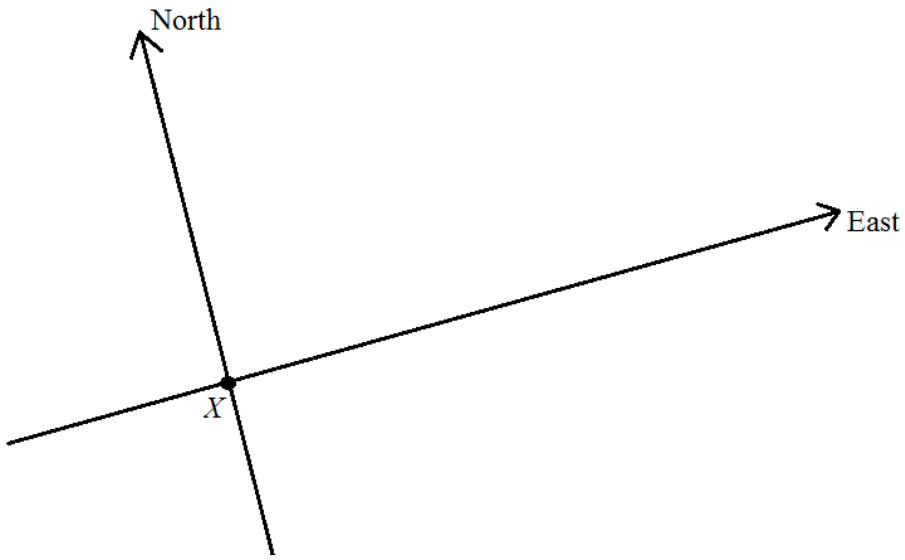
3 marks



b. Calculate the angle of elevation of the kite from the observer's eyes in degrees and minutes. Correct your answer to the nearest minute.

3 marks

Q5 A car travels from Campsite X 1.5 km in the direction 040°T to Campsite Y, and then 2.0 km in the direction 130°T to Campsite Z. Campsite X is marked as a dot in the following diagram.



a. Use dots to accurately locate Campsite Y and Campsite Z on the above diagram. Draw straight lines to show the routes of the car from X to Y and then from Y to Z.

3 marks

b. On the above diagram write down the measure of $\angle YXZ$ in degrees. 1 mark

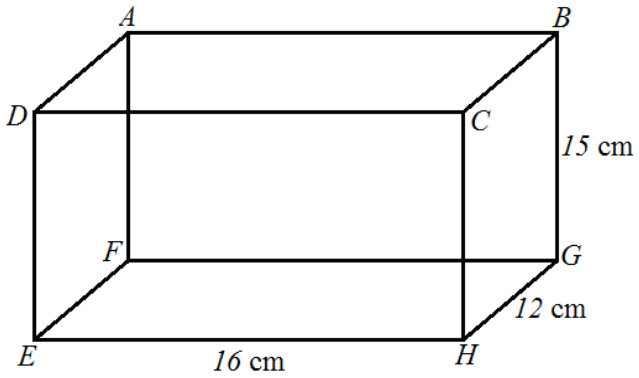
c. On the above diagram write down the measure of $\angle XYZ$ in degrees. 1 mark

d. Determine the distance of Campsite Z from Campsite X. 2 marks

e. Determine the compass bearing of Campsite Z from Campsite X. 1 mark

f. Determine the true bearing of Campsite X from Campsite Z. 2 marks

Q6 Consider the following three dimensional figure *ABCDEFGH* called a cuboid where the six faces are all rectangles. The side measures are shown in the diagram. The diagram is not drawn to scale.



a. Draw a face diagonal of rectangle *EFGH* on the above diagram. Calculate its length. 2 marks

b. Draw the body diagonal starting from corner E. Calculate its length. 2 marks

c. Calculate the size of $\angle FEG$ in decimal degrees. Correct your answer to 2 decimal places. 2 marks

d. Calculate the size of $\angle BEG$ in decimal degrees. Correct your answer to 2 decimal places. 2 marks

e. Calculate the size of $\angle HAF$ in decimal degrees. Correct your answer to 2 decimal places. 1 mark

