# Year 10 Mathematics Essentials

## 2018 College Topic Test

Geometry

**NAME:** _____

Mark _____ /

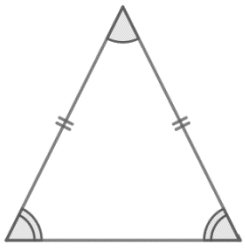
*Note:*

- *Weighting for this test is 15% of the semester total of 100%.*
- *Duration of the test is 1 lesson*
- *For full marks, all appropriate calculations must be shown*
- *Diagrams are NOT drawn to scale so do not attempt to gain answers by measurement*
- *Unless stated otherwise, round all decimals to 2 decimal places*
- *You are permitted to bring to the test*
    - *a scientific calculator*
    - *One page of notes on A4 sized paper, single sided and in your own handwriting*

## Knowledge (32 marks):

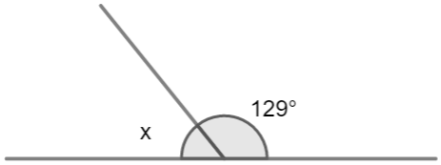
| | Marks Weighting % | Maximum Marks | Marks Achieved |
|---|---|---|---|
| **Knowledge** | ~69.5% | 32 | |
| **Application** | ~19.5% | 9 | |
| **Extension** | ~11% | 5 | |
| **Total** | | **46** | |
| | | **Percentage** | |

1. What is the name of this type of triangle?



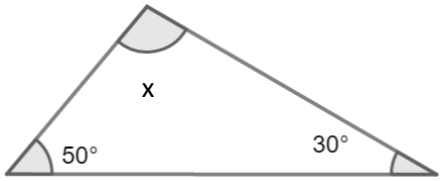
[1 Mark]

2. Find the value of $x$.



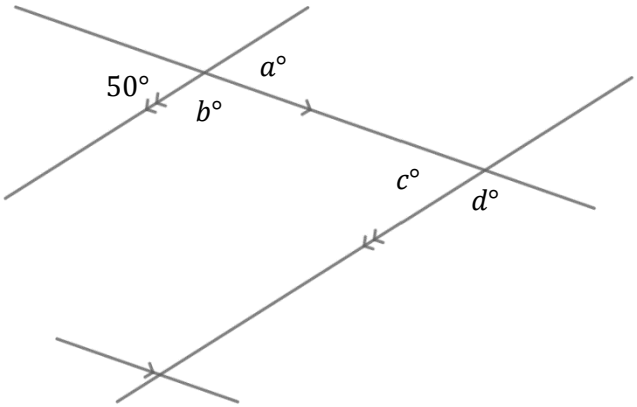

[1 Mark]

3. Find the value of $x$ in this triangle




[1 Mark]

4. Which of the following angles are equal to 50°?




[2 Marks]

5. Which of the following is **not** a test for congruence?

SSS SAS AAA RHS

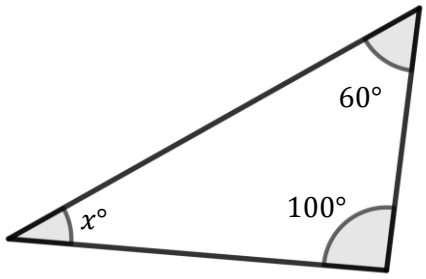
[1 Mark]

6. Which of the following rules does **not** state that two angles are equal?

Corresponding Angles | Co-interior Angles | Alternate Angles | Vertically Opposite Angles

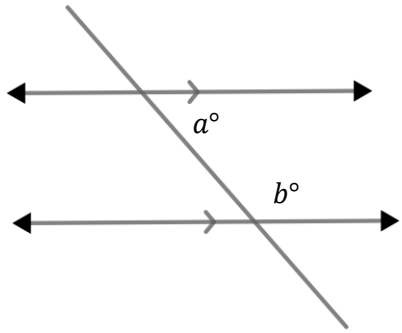
[1 Mark]

7. Could the value of $x$ be $30°$ in the triangle? Give a reason why/why not.




[2 Marks]

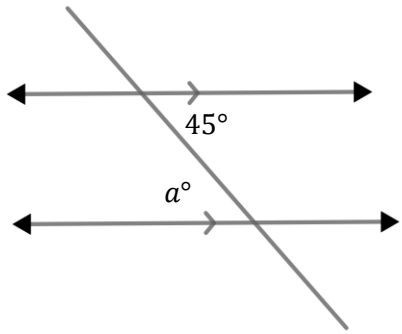
8. State why the angles $a$ and $b$ are supplementary.




[1 Mark]

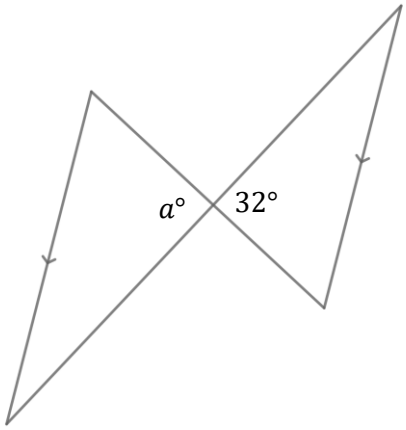
9. Find the size of the unknown angle $a$, giving appropriate geometric reasoning.

a)



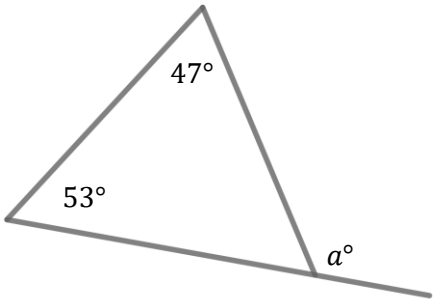

[2 Marks]

b)




[2 Marks]

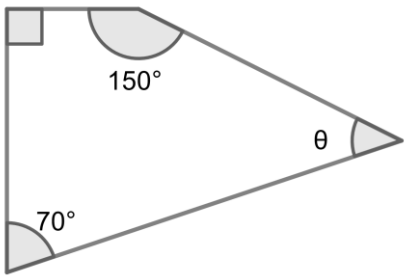
c)




[2 Marks]

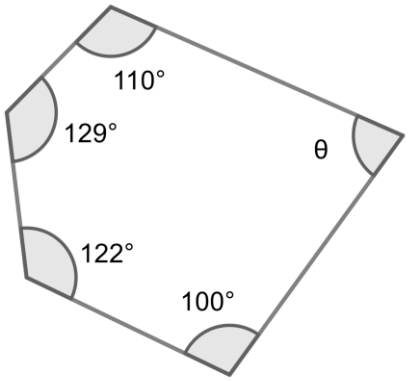
10. Find the value of $\theta$ in the following shapes.

a)



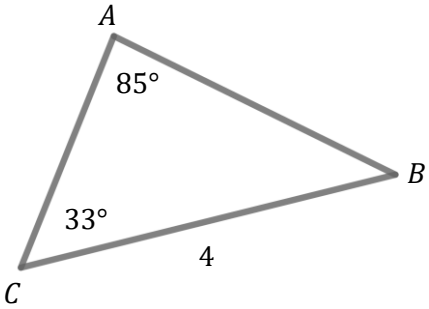

[2 Marks]

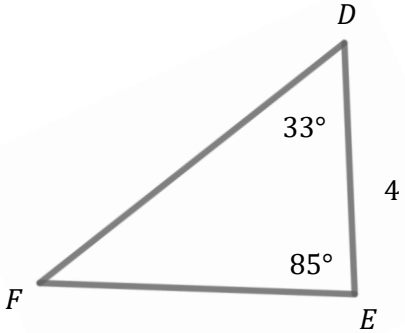
b)




[3 Marks]

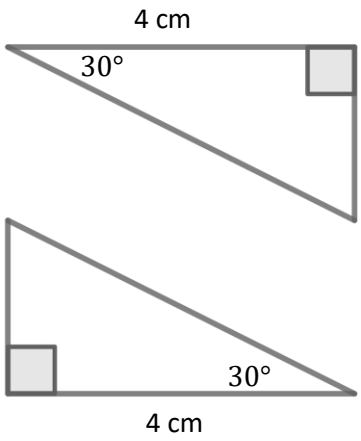
11. Prove the following pair of triangles are similar. Include a similarity statement.



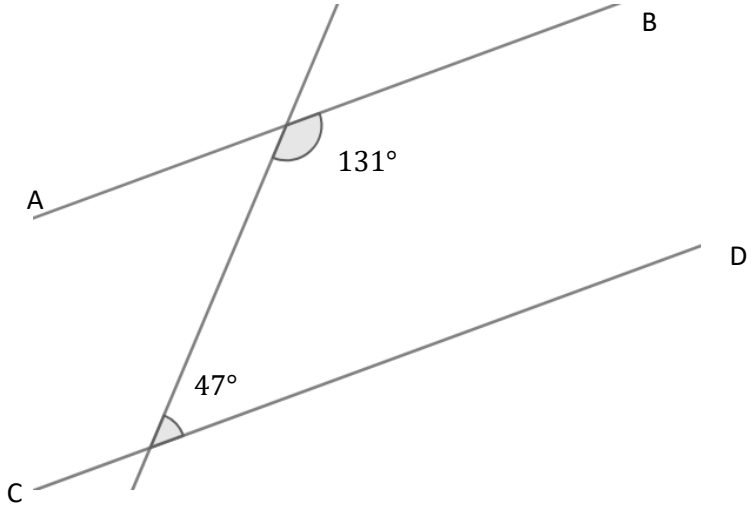

[4 Marks]

12. Prove the following pair of triangles are congruent. Include a congruency statement.




[5 Marks]

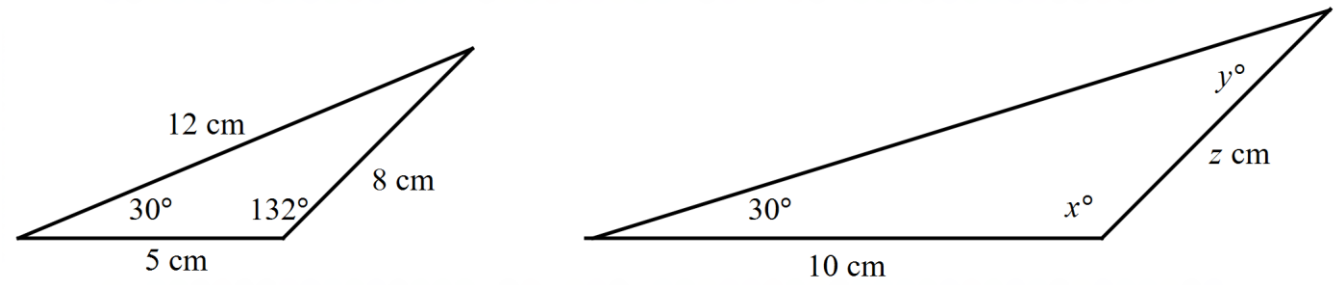
13. Are the lines AB and CD parallel? Give reasons why/why not.




[2 Marks]

## Applications (9 marks):

14. The triangles shown below are similar.



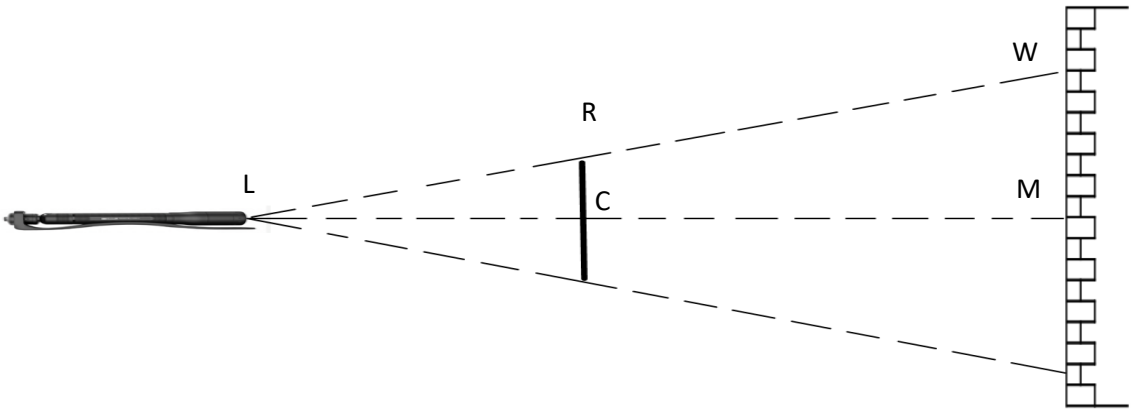

a) Find the value of $x$.

b) Find the value of $y$.

c) Find the value of z.

[1 + 2 + 2 = 5 Marks]

15.




A 30 cm ruler is held between a torch and a wall. The ruler is 80 cm from the torch and 160 cm from the wall.

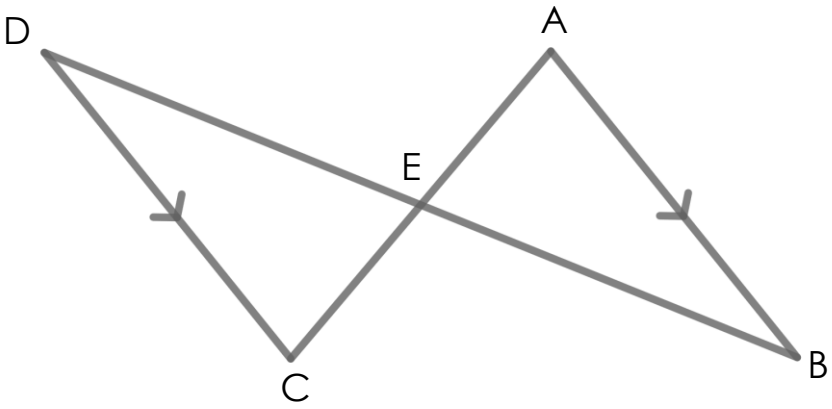
a) Given that $\Delta LRC$ is similar to $\Delta LWM$, work out the scale factor.

[2 Marks]

b) Hence, or otherwise, find the length of the shadow on the wall.

[2 Marks]

## Extension (5 marks):




16. Consider the diagram.
    a) Prove that $\Delta ABE$ is similar to $\Delta DCE$. Include a similarity statement.

[3 Marks]

    b) If side DE = side EB, are $\Delta ABE$ and $\Delta DCE$ congruent? Give reasons for your answer.

[2 Marks]