Name:

Level 2 Further Maths

Geometric Proof

Corbettmaths

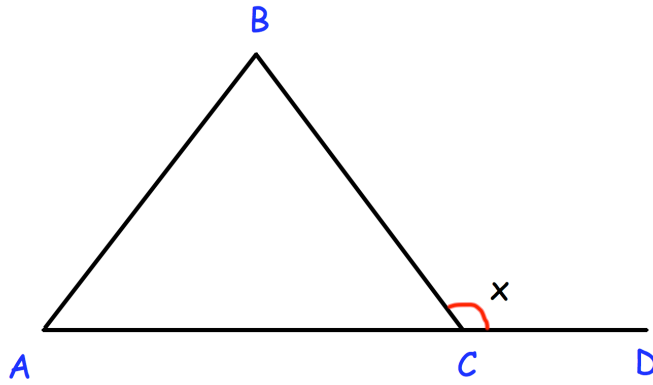Ensure you have: Pencil or pen

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Revision for this topic

www.corbettmaths.com/more/further-maths/

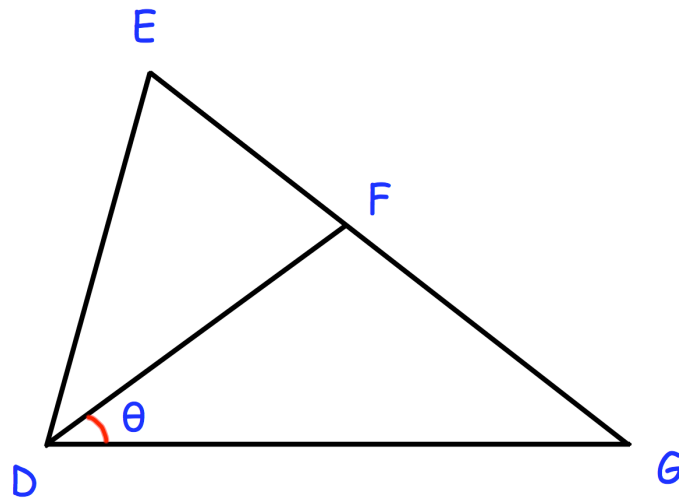1. ABC is an isosceles triangle.
   AB = BC
   ACD is a straight line.

Angle BCD $= x°$

Prove angle ABC $= (2x - 180)°$
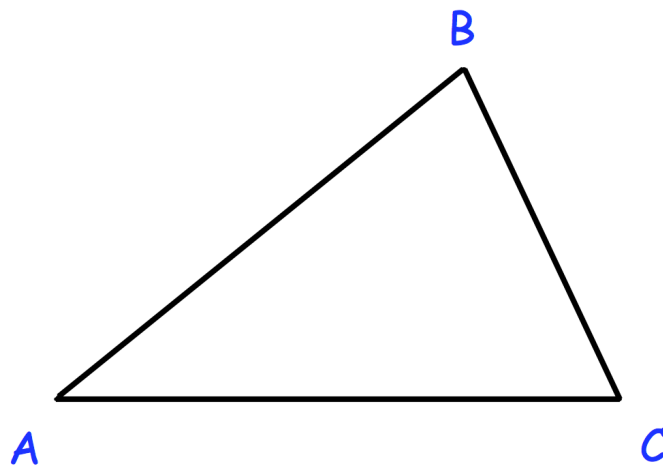
(3)

2. Shown below is triangle DEG

DE = DF = FG

$\angle FDG = \theta$
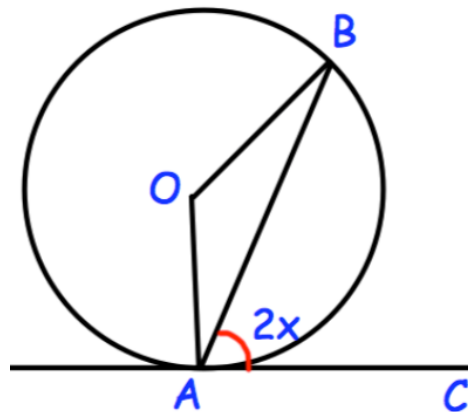
Prove that $\angle EDF = 180 - 4\theta$

(3)

3.   ABC is a triangle.

Prove the angles in triangle ABC add up to 180˚

(3)

4. A and B are points on the circumference of a circle, centre O.

AC is a tangent to the circle.
Angle BAC $= 2x$

Prove that angle AOB $= 4x$
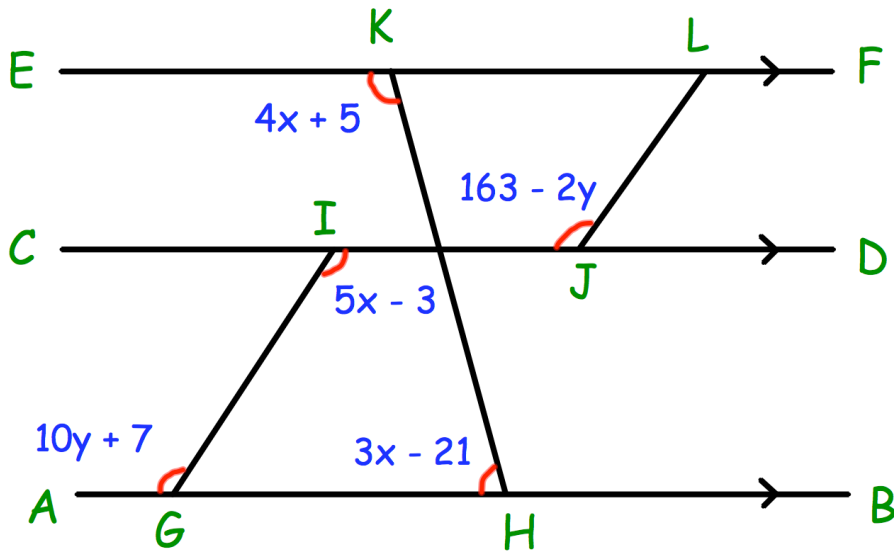
Give reasons for each stage of your working.

(3)

5. The bearing of B from A is x, where x is less than $180°$

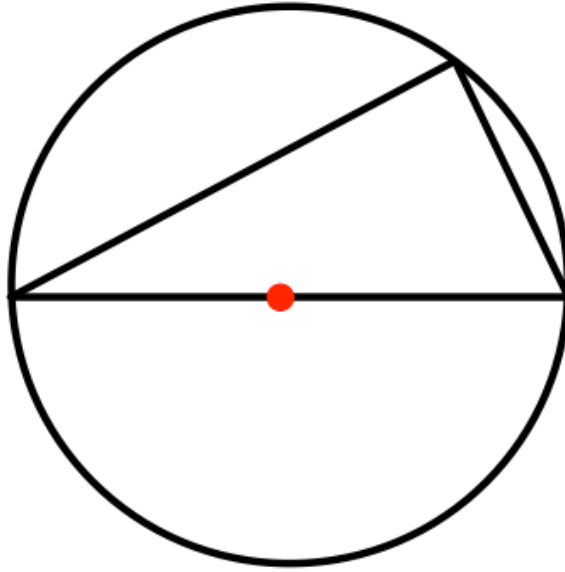Prove the bearing of A from B is $(180 + x)°$

(3)

6. The lines AB, CD and EF are parallel.
   GI, HK and JL are straight lines.
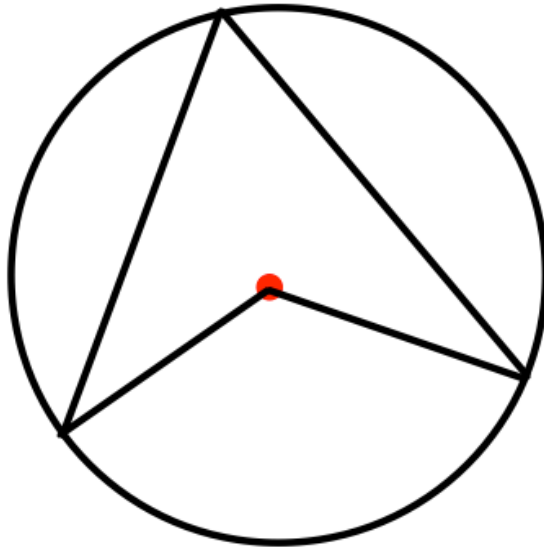

Show GI and JL are parallel.

(5)

7.

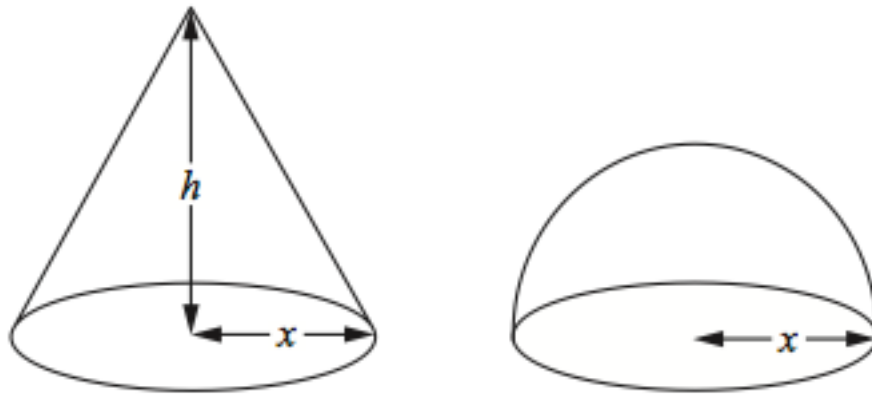Prove that the angle in a semi-circle is always 90°

(4)

8.

Prove that the angle at the centre is twice the angle at the circumference.

(4)

9.   The diagram shows a cone and a hemisphere.
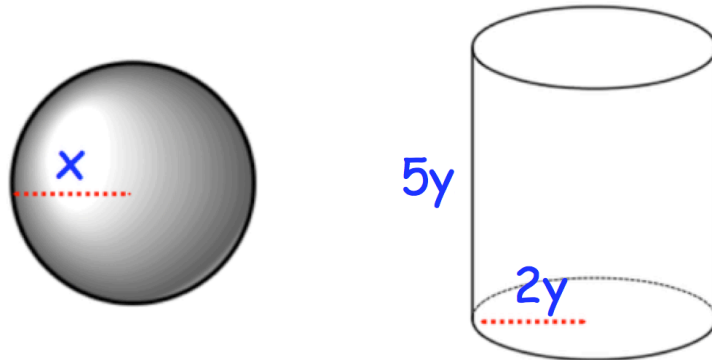

The hemisphere has base radius x cm.
The cone has base radius x cm and perpendicular height h cm.

The volume of the cone is equal to the volume of the hemisphere.

Show that $h = 2x$

(4)

10.   A sphere has radius x cm.
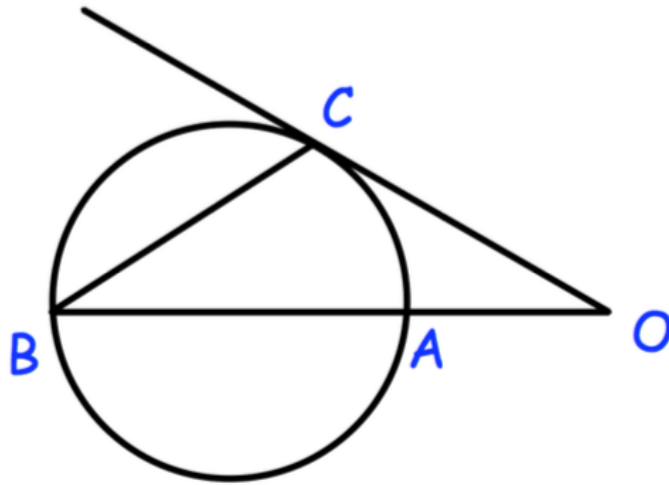   A cylinder has radius 2y cm and height 5y cm.

      The surface area of both shapes are equal.
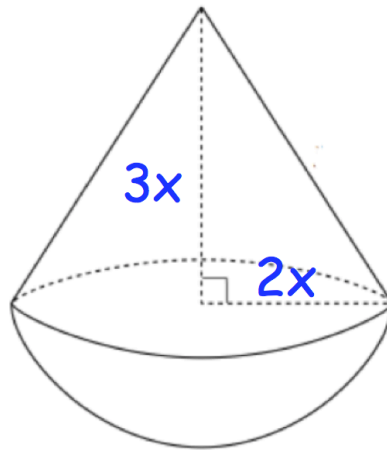
      Show $x : y = \sqrt{7} : 1$

(5)

11. OAB is a straight line and OC is a tangent to the circle.

Prove OBC and OAC are similar.

(4)

12.   The diagram shows a solid made up of a cone and a hemisphere.
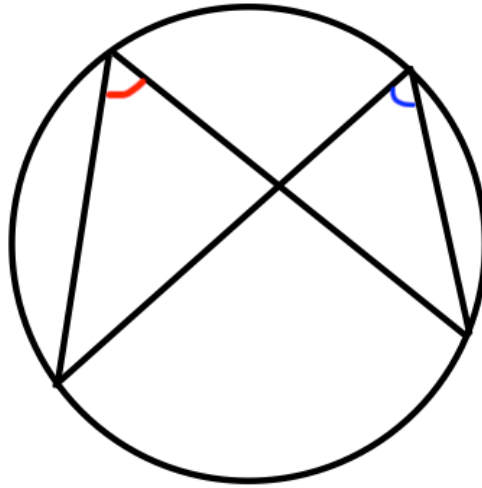

The radius of the cone is x
The height of the cone is 2x.

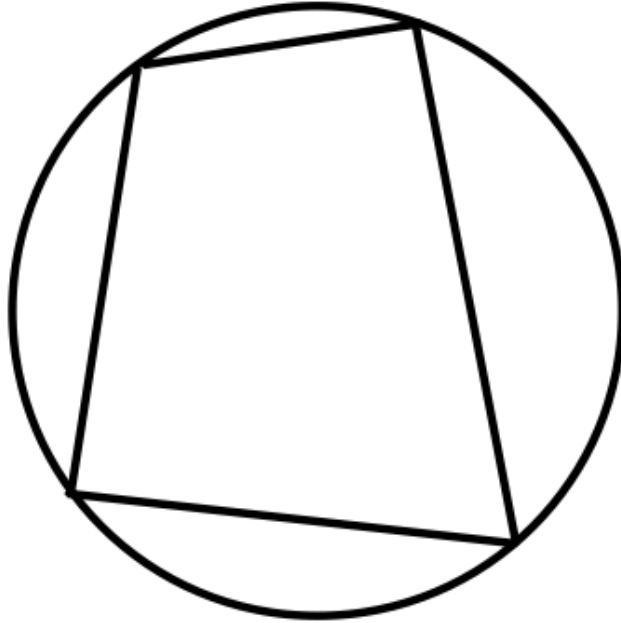Show the volume of the solid is $\dfrac{28}{3}\pi x^3$

(4)

13.

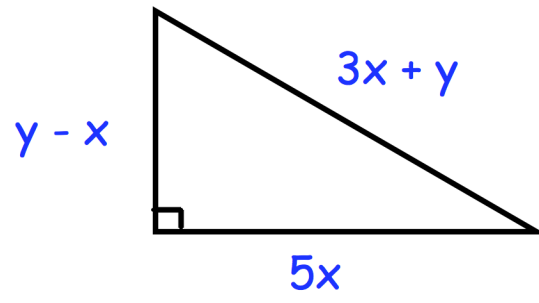Prove the angles in the same segment are equal.

(4)

14.

Prove the opposite angles in a cyclic quadrilateral add to 180°

(4)

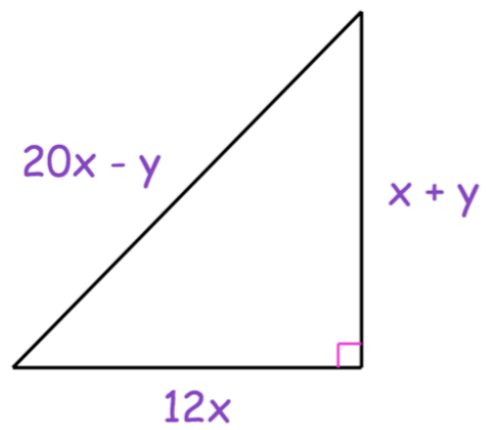15.

$3x + y$

$y - x$

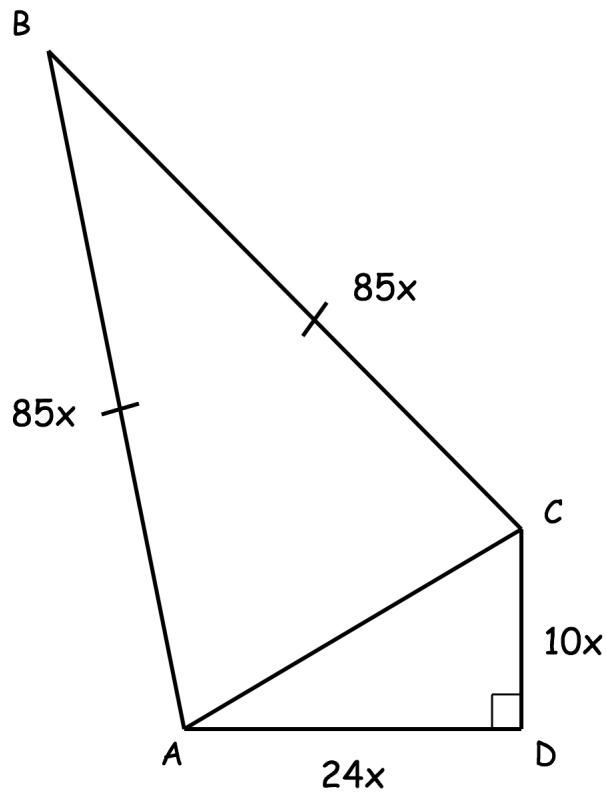$5x$

Prove $x : y = 8 : 17$

(4)

16. Below is a right angled triangle.
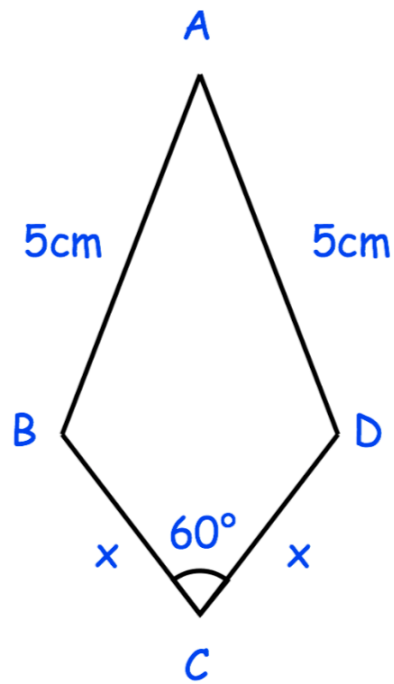

Prove $x : y = 14 : 85$

(4)

17. Shown below is quadrilateral ABCD.
    ABC is an isosceles triangle.
    ACD is a right angled triangle.

Show that the area of quadrilateral ABCD is $1212x^2$

(6)

18.   Shown below is a kite, ABCD.

Prove $CosBAD = 1 - \dfrac{x^2}{50}$

(6)