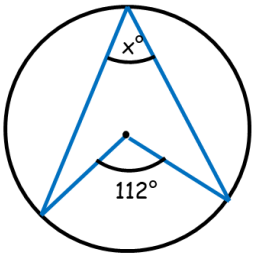
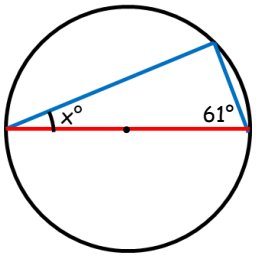
Circle Theorems – RAGG Worksheet (RED)

1.



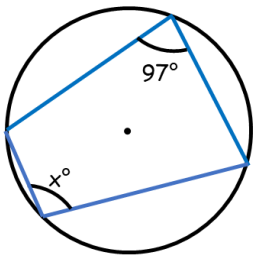
Name or description of theorem:

2.



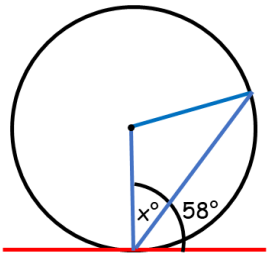
Name or description of theorem:

3.



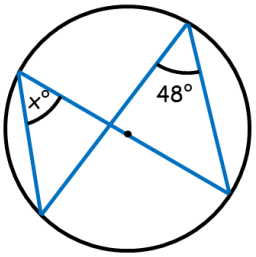
Name or description of theorem:

4.



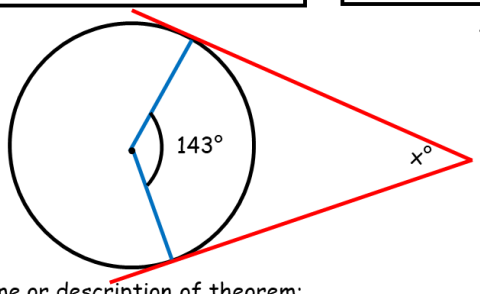
Name or description of theorem:

5.



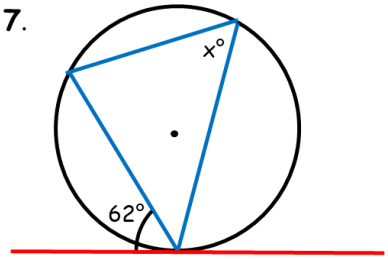
Name or description of theorem:

6.



Name or description of theorem:

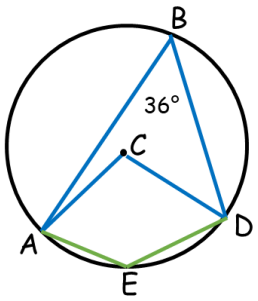
7.



Name or description of theorem:

Circle Theorems – RAGG Worksheet (AMBER)

1.



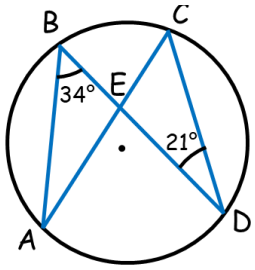
Angle ACD = _____

Give a reason for your answer:

Angle AED = _____

Give a reason for your answer:

2.



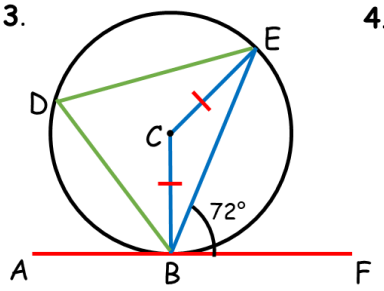
Angle ACD = _____

Give a reason for your answer:

Angle BEA = _____

Give a reason for your answer:

3.



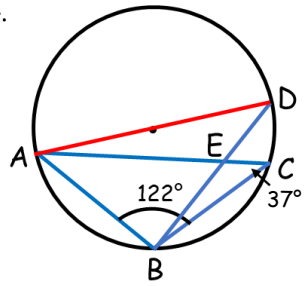
Angle BCE = _____

Give a reason for your answer:

Angle BDE = _____

Give a reason for your answer:

4.



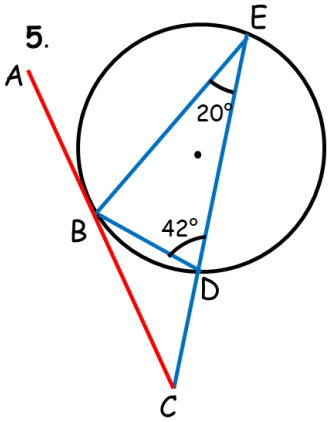
Angle CBD = _____

Give a reason for your answer:

Angle AED = _____

Give a reason for your answer:

5.



Angle ABE = _____

Give a reason for your answer:

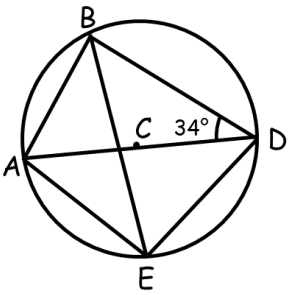
Angle BCD = _____

Give a reason for your answer:

RAGG it Maths....

Circle Theorems – RAGG Worksheet (GREEN)

1.

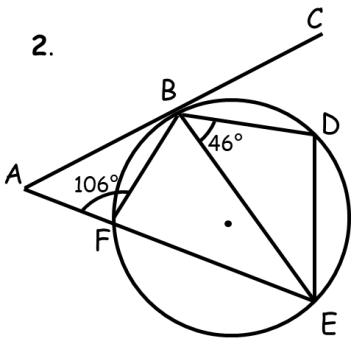


Calculate angle DEB= _____

Give a reason for each step in your workings

5 marks

2.

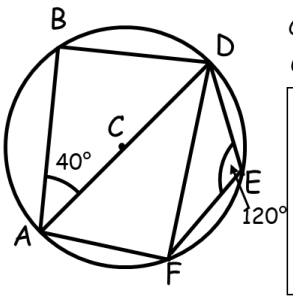


Calculate angle DBC= _____

Give a reason for each step in your workings

4 marks

3.

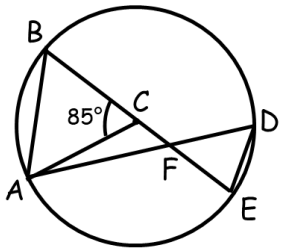


Calculate angle BDA= _____

Give a reason for each step in your workings

4 marks

4.

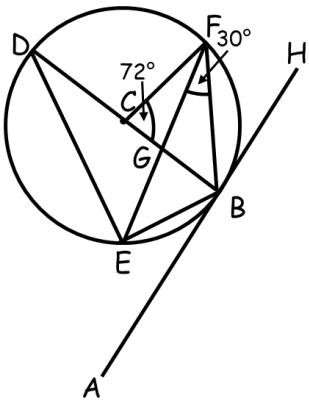


Calculate angle ADE= _____

Give a reason for each step in your workings

4 marks

5.



Calculate angle FBH= _____

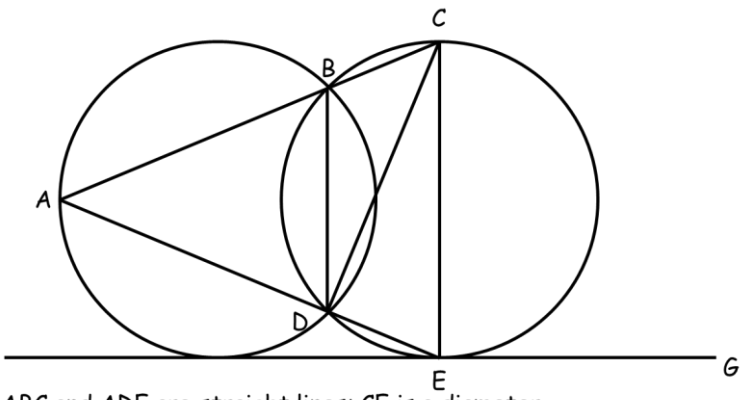
Give a reason for each step in your workings

5 marks

RAGG it Maths....

Circle Theorems – RAGG Worksheet (GOLD)

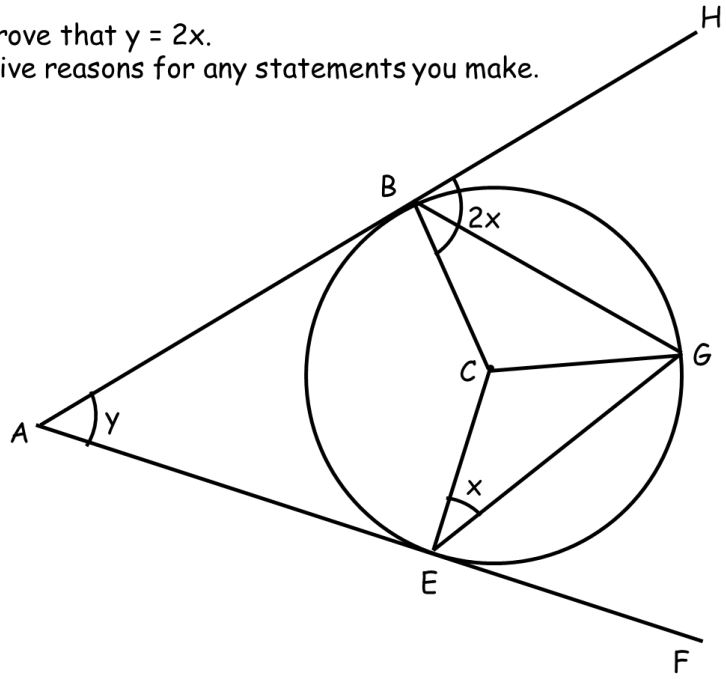
1.



ABC and ADE are straight lines; CE is a diameter.
Angle DCE = x°, BCD = 2x° and FEG is a tangent.
Find in terms of x:

a) Angle ABD
b) Angle DBE
c) Angle BAD

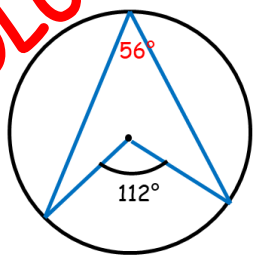
2. Prove that y = 2x.
Give reasons for any statements you make.



SOLUTIONS

Circle Theorems – RAGG Worksheet (RED)

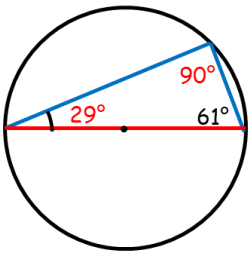
1.



Name or description of theorem:

Angles are the centre are half angles at the circumference.

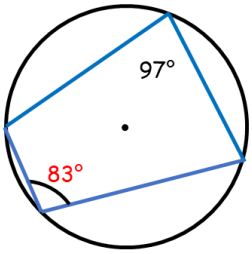
2.



Name or description of theorem:

Angles subtended by the diameter equal 90° (angles in a semi-circle).

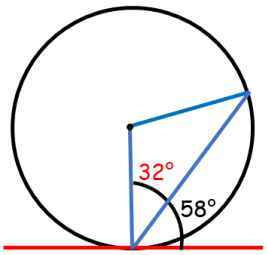
3.



Name or description of theorem:

Opposite angles in a quadrilateral add to 180° (cyclic quadrilateral).

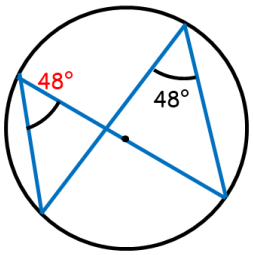
4.



Name or description of theorem:

A tangent meets are radius at 90°

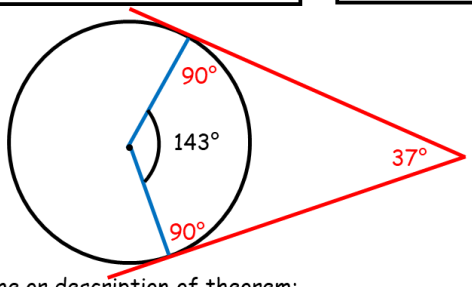
5.



Name or description of theorem:

Same segment theorem

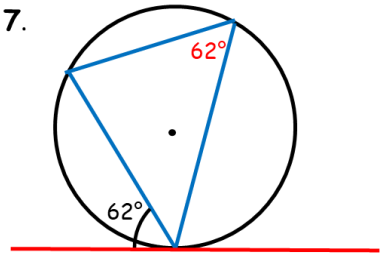
6.



Name or description of theorem:

Where a tangent meets a radius it meets at 90°

7.

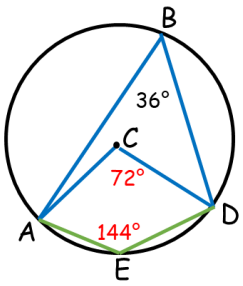


Name or description of theorem:

Alternate segment theorem

Circle Theorems – RAGG Worksheet (AMBER)

1.



Angle ACD = 72°

Give a reason for your answer:

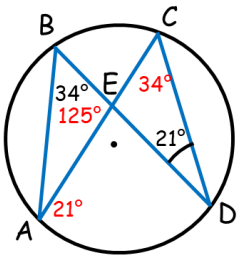
Angles are the centre are half angles at the circumference.

Angle AED = 144°

Give a reason for your answer:

Opposite angles in a quadrilateral add to 180° (cyclic quadrilateral).

2.



Angle ACD = 34°

Give a reason for your answer:

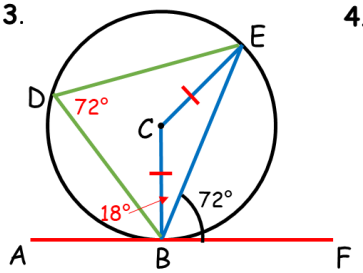
Same segment theorem

Angle BEA = 125°

Give a reason for your answer:

Using the same segment theorem, angle BAC = 21° and angles in a triangle add to 180°

3.



Angle BCE = 18°

Give a reason for your answer:

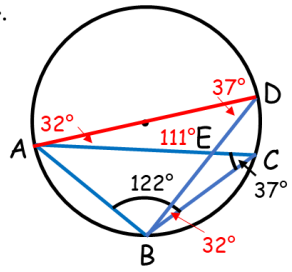
A tangent meets are radius at 90°

Angle BDE = 72°

Give a reason for your answer:

Alternate segment theorem

4.



Angle CBD = 32°

Give a reason for your answer:

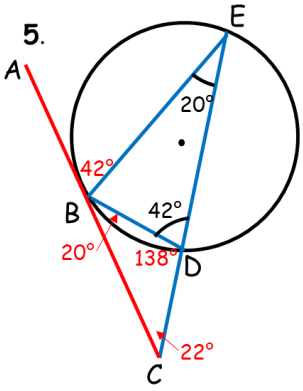
Angles subtended by the diameter equal 90° (angles in a semi-circle).

Angle AED = 111°

Give a reason for your answer:

Angles in the same segment are equal and angles in a triangle add to 180°.

5.



Angle ABE = 42°

Give a reason for your answer:

Alternate segment theorem

Angle BCD = 22°

Give a reason for your answer:

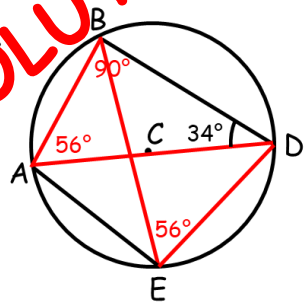
Angle DBC = 20° because of the alternate segment theorem.
Angle BDC = 138° because of angles on a straight line.
Angle BCD = 22° because of the angles in a triangle.

RAGG it Maths....

SOLUTIONS

Circle Theorems – RAGG Worksheet (GREEN)

1.



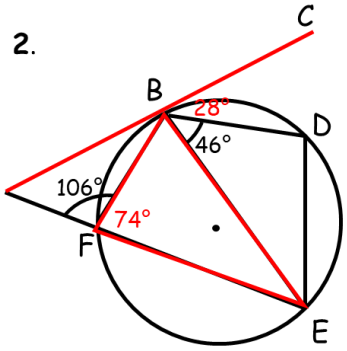
Calculate angle DEB= 56°

Give a reason for each step in your workings

Angle ABD = 90° because of angles in a semi-circle.
Angle DAB = 56° because angles in a triangle add to 180°.
Angle DEB = 56° because of the same segment theorem.

5 marks

2.

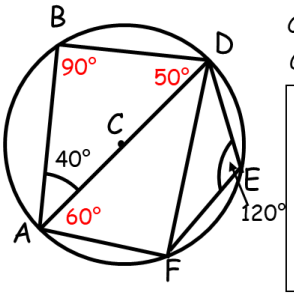


Calculate angle DBC= 28°

Give a reason for each step in your workings

Angle ABD = 74° because angles on a straight line add to 180°.
Angle ABD = 28° because of the alternate segment theorem, as CBD and DBE must add to make 74°.

3.



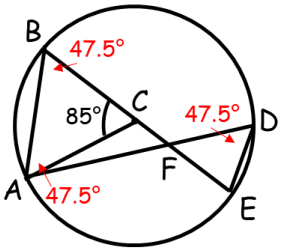
Calculate angle BDA= 50°

Give a reason for each step in your workings

Angle DAF = 60° because of the cyclic quadrilateral theorem.
Angle ABD = 90° because of angles in a semi-circle.
Angle BDA = 50° because of angles in a triangle.

4 marks

4.



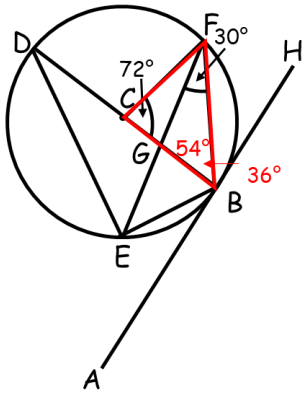
Calculate angle ADE= 47.5°

Give a reason for each step in your workings

Angle CBA = 47.5° because an isosceles triangle has two equal angles and all three angles add to 180°.
Angle ADE = 47.5° because of the same segment theorem.

4 marks

5.



Calculate angle FBH= 36°

Give a reason for each step in your workings

Triangle CFB is an isosceles triangle as it is made up of two radii.
Angle's CBF and CFB = 54° because angles in a triangle add to 180° (180° - 72° = 108°, 108° ÷ 2 = 54).
Where a tangent meets a radius it meets at 90°.
Therefore, FBH = 36°, as 90° - 54° = 36°.

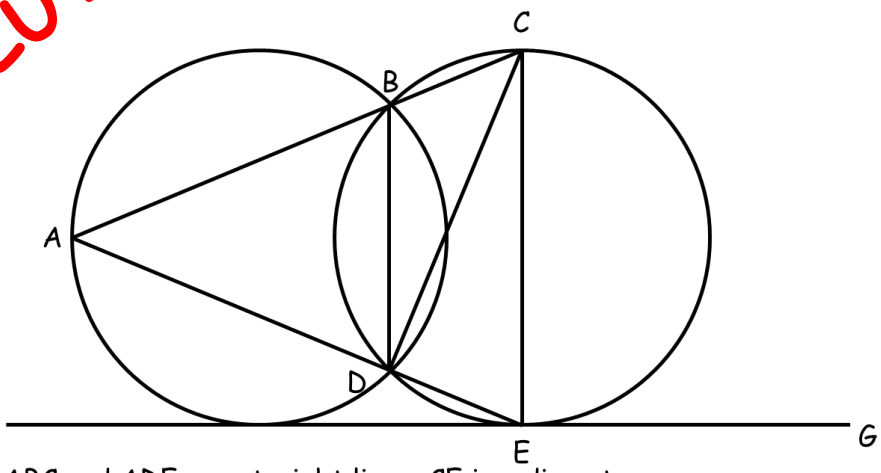
5 marks

RAGG it Maths....

SOLUTIONS

Circle Theorems – RAGG Worksheet (GOLD)

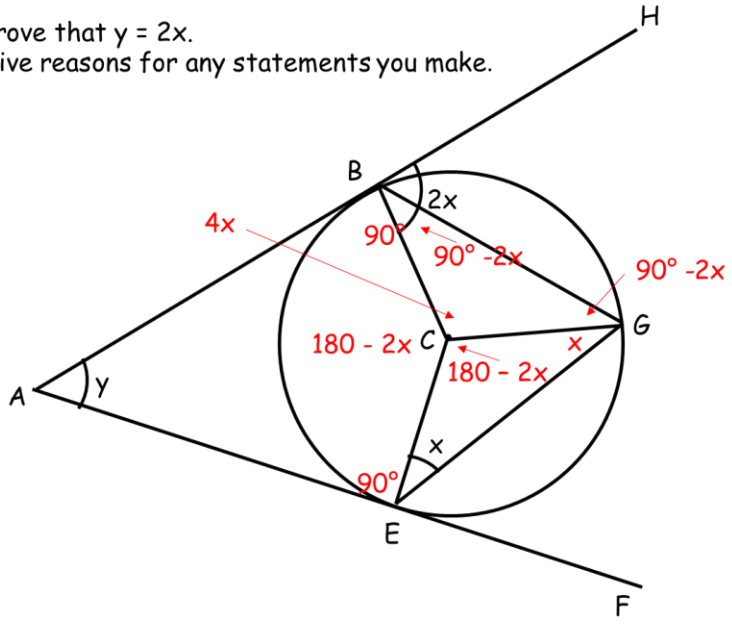
1.



ABC and ADE are straight lines; CE is a diameter.
Angle DCE = x°, BCD = 2x° and FEG is a tangent.
Find in terms of x:

a) Angle ABD = 90 - x°
b) Angle DBE = x°
c) Angle BAD = 90 - 2x°

2. Prove that y = 2x.
Give reasons for any statements you make.



EGC = x, as CEG is an isosceles triangle.
ECG = 180° – 2x, as angles in a triangle equal 180°.
GBC = 90 ° – 2x, because a tangent meet a radius at 90.
CGB = GBC, as triangle BCG is also isosceles.
BCG = 4x, as angles in a triangle add to 180° :
180°– (90° - 2x) – (90° – 2x) = 4x.
Angles around a point add to 360°, therefore BCE = 180° - 2x:
360° – (180° - 2x) – 4x = 180° – 2x.
ABC = CEA = 90°, as where a tangent meets a radius it 90°.
Angles in a quadrilateral add to 360° therefore y = 2x:
360° – 90° – 90° – (180° - 2x) = 2x.