Paper 3 Preparation Paper

Edexcel Higher

Corbettmaths

You will need a calculator

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

Guidance

1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

Revision for this test

www.corbettmaths.com/contents

1. STANDARD FORM (videos 300-303)

The King's Palace	5.4 million
Castle	923,840
Theme Park	1.43×10^7
Science Museum	4,192,900

(a) Write the number of visitors to the Theme Park as an ordinary number.

.....

(1)

(b) Write the number of visitors to the Castle in standard form.

.....

(1)

(c) How many more people visited the Theme Park than the Science.

.....

(2)

2. CURRENCY (Video 214a)

Kevin is going on holiday to Japan.
He wants to change some money into yen.

The bank only stocks ¥1000 notes.
James wants to change up to £300 into yen.
He wants as many ¥1000 notes as possible.

The exchange rate is £1 = ¥168

How many ¥1000 notes should he get?

.....

(3)

3. RATIO (videos 269-271)

4 schools sent students to a languages course.

One of the schools sent both French and German students.
The ratio of French to German students it sent was 1 : 3
The school sent 21 German students.

The other 3 schools sent the same number of students.

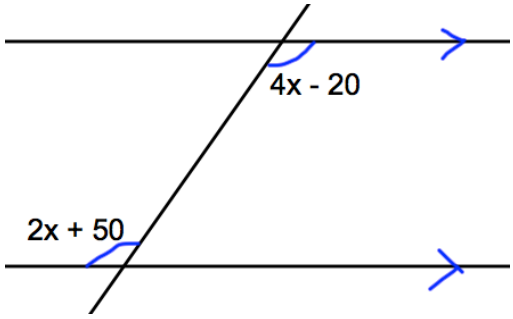
Work out the total number of students sent to the languages course.

.....

(4)

4. EQUATIONS (Videos 110, 113, 114, 115)

The diagram below shows a pair of parallel lines.



Calculate the size of the angle, 2x + 50.

.....^{0}

(4)

5. SIMULTANEOUS EQUATIONS (Videos 295, 298)

Solve the simultaneous equations

$4x + 3y = 5$
$2x - 5y = 9$

Do not use trial and improvement

x = ... y = ...

(4)

6. REVERSE PERCENTAGES (Video 240)

A fish tank sprung a leak and loses 45% of its water.
There is now 363 litres of water in the fish tank.

How much water was in the fish tank before the leak?

.....l

(3)

7. COMPLETING THE SQUARE (videos 10, 371)

Write $x^2 + 8x + 6$ in the form $(x + a)^2 + b$, where a and b are constants.

.....

(3)

8. CAPTURE RECAPTURE (video 391)

A group of scientists want to estimate the number of eels in a lake.
They catch and ring 60 eels.
They return the 60 eels to the lake.
They then catch 180 eels and 15 are ringed.

Estimate the number of eels in the lake.

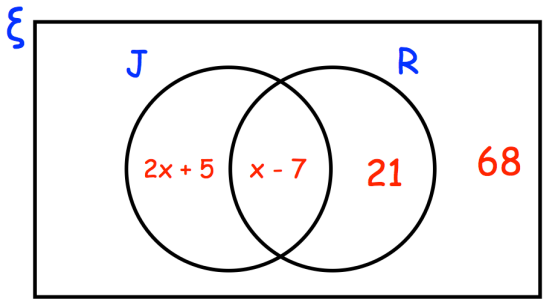
.....

(2)

9. VENN DIAGRAMS (video 380)

The Venn diagram shows information about the cars in a car park.

ξ = 150 cars in the car park
R = red cars
J = cars manufactured in Japan



A car is chosen at random.
Work out the probability that it is red.

.....

(4)

10. NTH TERM - LINEAR (video 288, 289)

The first 5 terms in a number sequence are

2 2.5 3 3.5 4 ... ...

(a) Work out the *n*th term of the sequence.

.....

(2)

(b) Work out the 20^{th} term of the sequence.

.....

(2)

11. QUADRATIC NTH TERM (Video 388)

Here are the first 5 terms of a quadratic sequence

4 10 18 28 40

Find an expression, in terms of n, for the nth term of this quadratic sequence.

.....

(3)

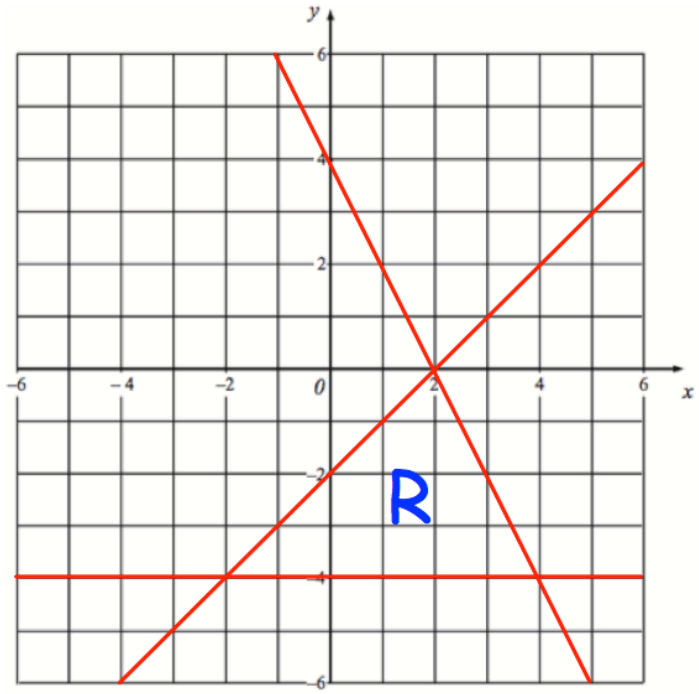
12. CHANGING THE SUBJECT (videos 7, 8)

Rearrange $y + 3 = x(y + 2)$ to make y the subject of the formula.

y = ...

(4)

13. INEQUALITIES - REGIONS (video 182)



The region labelled R satisfies three inequalities.

State the three inequalities

.....

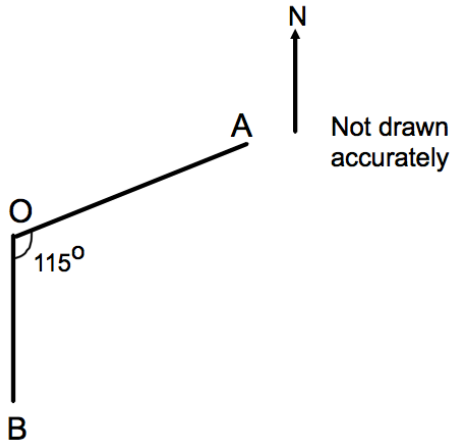
.....

.....

(3)

14. BEARINGS (videos 26, 27)

Gregory is at O and there are two roads, one towards A and another towards B. B is due South of O.



Gregory walks towards A.

(a) On what bearing does he walk?

.....°

(2)

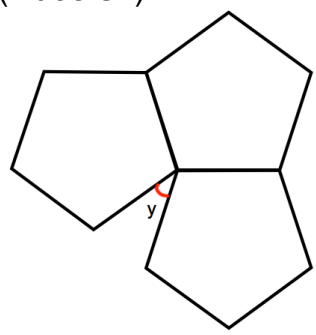
Joshua is at A and walks towards Gregory.

(b) On what bearing does he walk?

.....°

(2)

15. ANGLES IN POLYGONS (video 32)



Three identical regular pentagons are joined as shown above.
Work out the size of angle y.

y = ...°

(2)

16. ITERATION (video 373)

(a) Show that the equation $3x - x^3 = -11$ can be rearranged to give

$$x = \sqrt[3]{3x + 11}$$

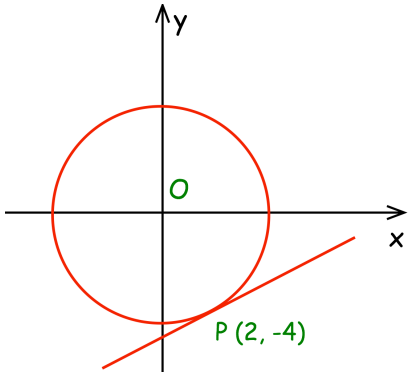
(2)

(b) Starting with $x_0 = 3$, use the iteration formula $x_{n+1} = \sqrt[3]{3x_n + 11}$ three times to find an estimate for the solution of $3x - x^3 = -11$

(3)

17. EQUATION OF A TANGENT (video 372)

Here is a circle, centre O, and the tangent to the circle at the point (2, –4).



Find the equation of the tangent at the point P.

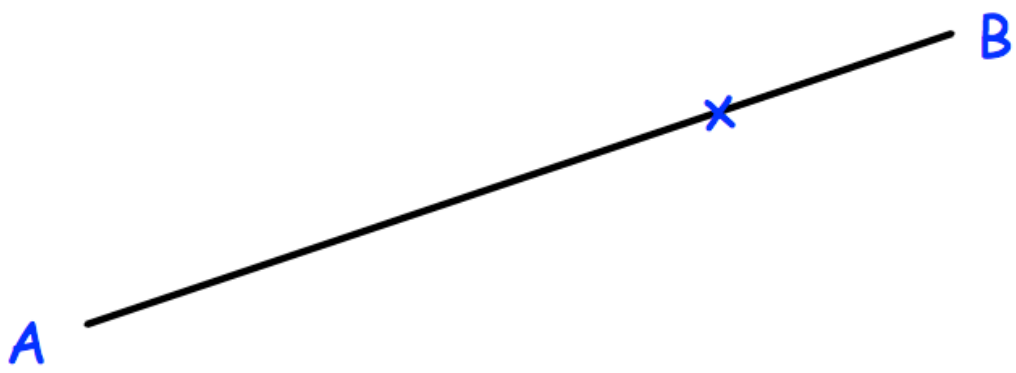
.....

(3)

18. CONSTRUCTIONS (videos 78, 72, 79, 80, 70)

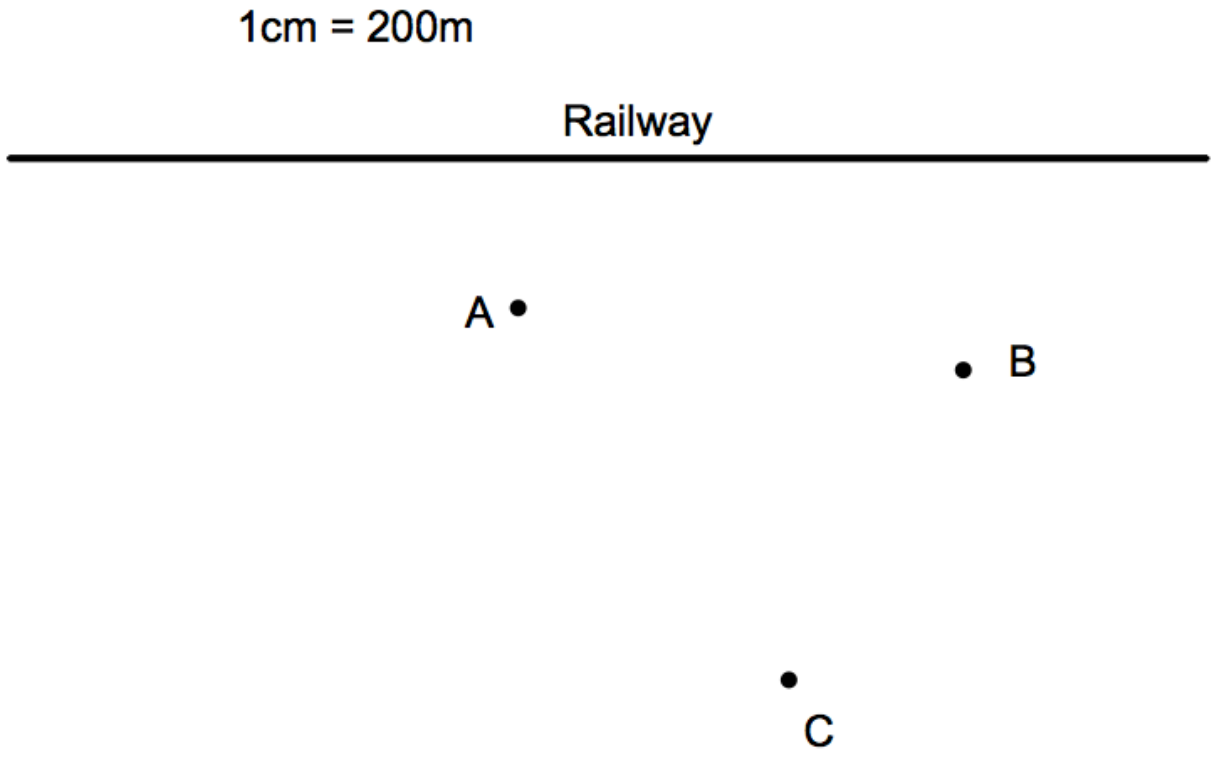
Use a ruler and compasses to construct the perpendicular to the line segment AB that passes through the point P.

You must show all construction lines.



19. LOCI (videos 75, 76, 77)

A phone box is located near three houses, A, B and C.



The phone box is less than 500m from the railway track.
The phone box is between 300m and 500m from house A.
The phone box is closer to house C than house B.

Shade the region on the map where the phone box could is located.

(5)

20. CIRCUMFERENCE (Video 60)

The circumference of a circle measures 19.5cm.

Work out the length of the radius of the circle.

.....cm

(2)

21. QUADRATIC FORMULA (video 267)

Solve the equation $4x^2 + x - 7 = 0$

Give your answers to two decimal places.

x = ... or x = ...

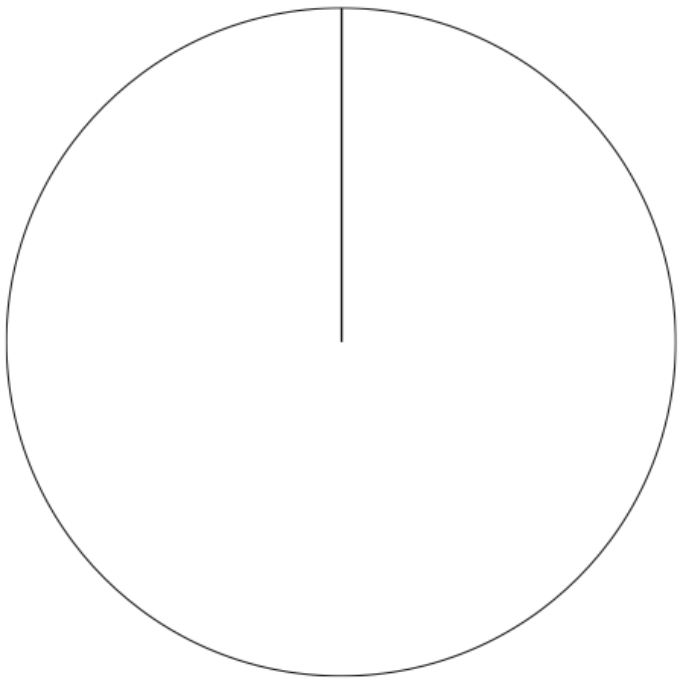
(3)

22. PIE CHARTS (video 163, 164)

The table gives information about the dogs in a village

Breed	Frequency
Spaniel	11
Poodle	7
Greyhound	4
Jack Russell	14

Draw an accurate pie chart to show this information.



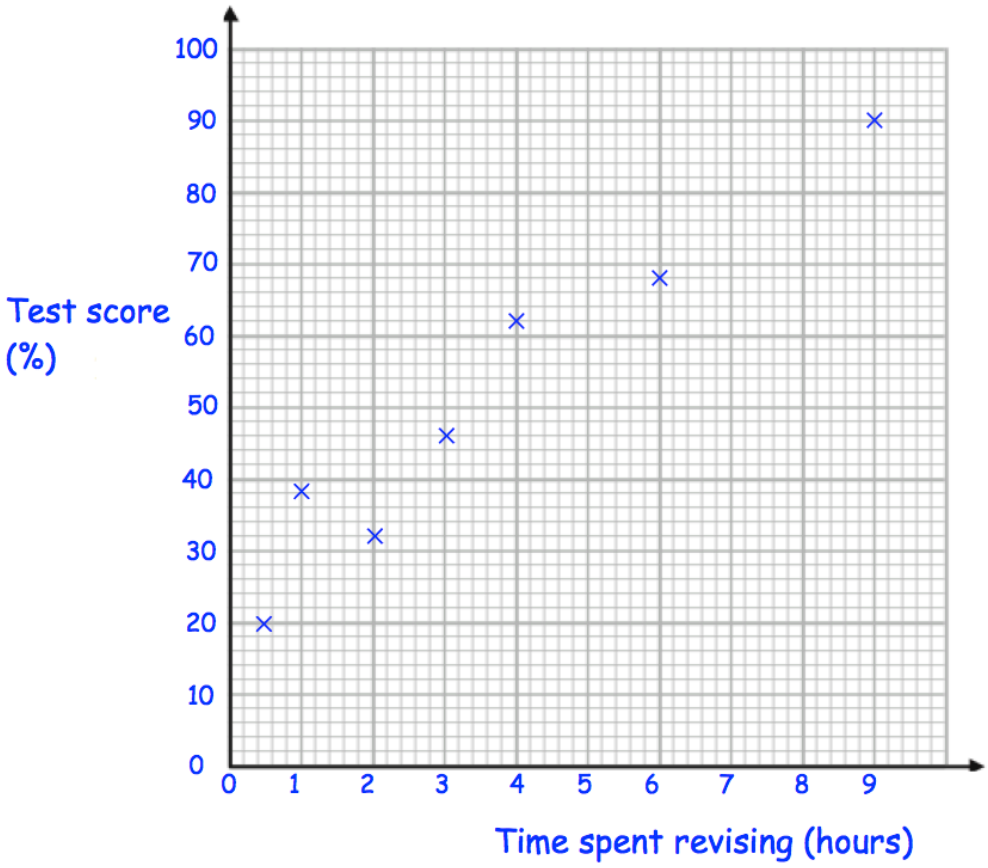
(4)

23. SCATTER GRAPHS (Video 165, 166)

The table shows the time spent revising and the test scores of ten students.

Time spent revising (hours)	9	0.5	1	4	6	2	3	7	5	8
Test result (%)	90	20	38	62	68	32	46	70	60	86

The first seven points have been plotted on this scatter diagram.



(a) Complete the scatter diagram.

(1)

(b) Describe the relationship shown in the scatter diagram.

.....

.....

(1)

(c) Draw a line of best fit on your scatter diagram.

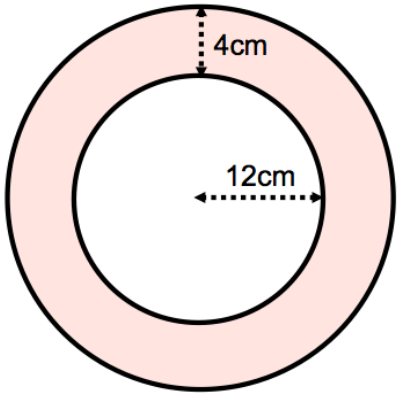
(1)

(d) Another student has spent 4.5 hours revising.
Use your line of best fit to estimate their test result.

.....%

(1)

24. AREA OF A CIRCLE (video 40)
Shown below is a circular photo surrounded by a frame.



The photo has radius 12cm.
The frame has width 4cm.

Work out area of the frame.
This area is shaded in the diagram.

.....cm²
(3)

25. ESTIMATED MEAN (Video 55)

Height	Frequency
$120 < h \leq 130$	51
$130 < h \leq 140$	120
$140 < h \leq 150$	66
$150 < h \leq 160$	59
$160 < h \leq 170$	4

Work out an estimate of the mean height

.....
(3)

26. CONDITIONAL PROBABILITY (Video 247)

There are x apples in a crate.
4 of the apples are bad.

Fiona chooses two apples from the crate, without replacement.
The probability she selects two bad apples is $^1/_{11}$

(a) Prove $x^2 - x - 132 = 0$

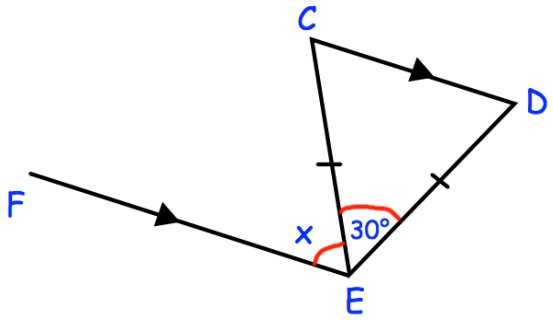
(3)

(b) Find x, the number of apples in the crate.

.....

(2)

27. ANGLES IN PARALLEL LINES (videos 25, 39)



Triangle CDE is isosceles.
CD is parallel to FE.
Angle CED = 30°

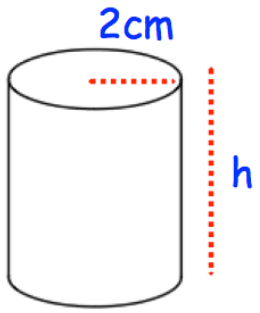
Work out the size of angle x.

.....°

(3)

28. VOLUME OF A CYLINDER (video 357)

A cylinder has radius 2cm.

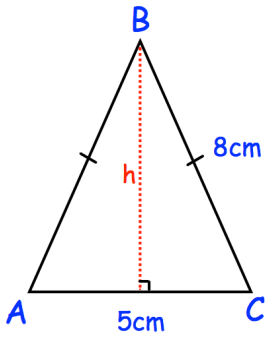


The volume of the cylinder is 100cm³
Calculate the height of the cylinder.

..... cm
(3)

29. PYTHAGORAS (Video 257)

ABC is an isosceles triangle.
AB = BC = 8cm
AC = 5cm

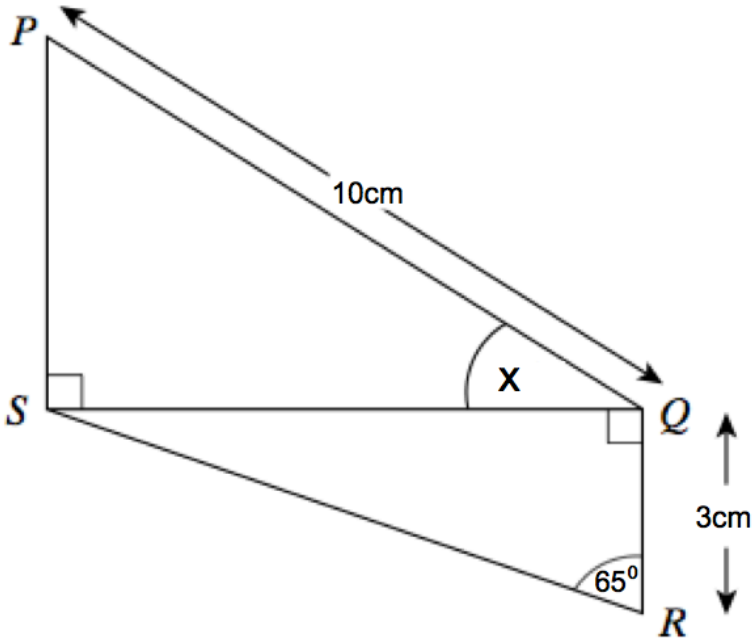


Calculate the area of the triangle.

.....cm²
(3)

30. TRIGONOMETRY (Video 329, 330, 331)

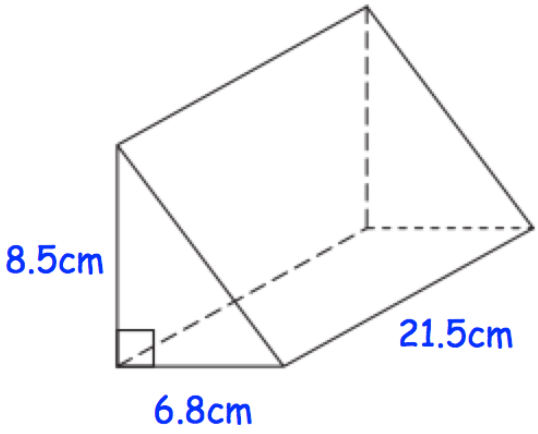
Two right-angled triangles are shown below.
PQ is 10cm.
QR is 3cm.
Angle QRS is 65^0



Calculate the size of angle PQS

31. VOLUME OF A PRISM (Video 311)

Shown below is a triangular prism.



Find the volume of the triangular prism.

.....cm³

(3)

32. SIMILAR SHAPES (Videos 292, 293a, 293b)

Two clay models of the Statue of Liberty are mathematically similar.

The smaller model has a height of 15cm.
The larger model has a height of 20cm.

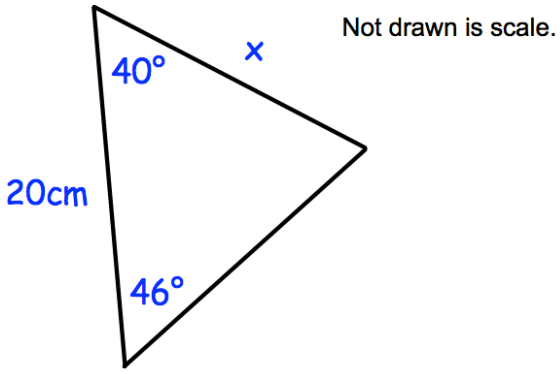
The smaller model has a mass of 108g.

Work out the mass of the larger model.

.....g

(3)

33. Sine Rule (Video 333)

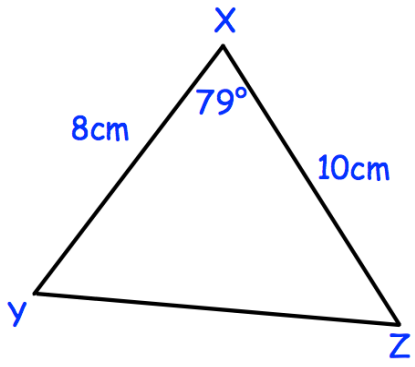


Find the size of x.

.....cm

(3)

34. Cosine Rule (Videos 335, 336) **and** 1/2abSinC (Video 337)



XY is 8cm,
XZ is 10cm,
angle YXZ = 79°

(a) Calculate the area of the triangle XYZ.

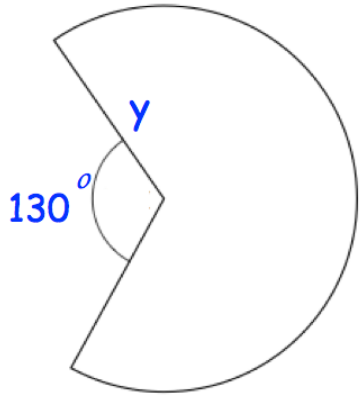
.....cm²

(3)

(b) Calculate the length of YZ.

.....cm
(3)

35. ARC LENGTH (video 58)



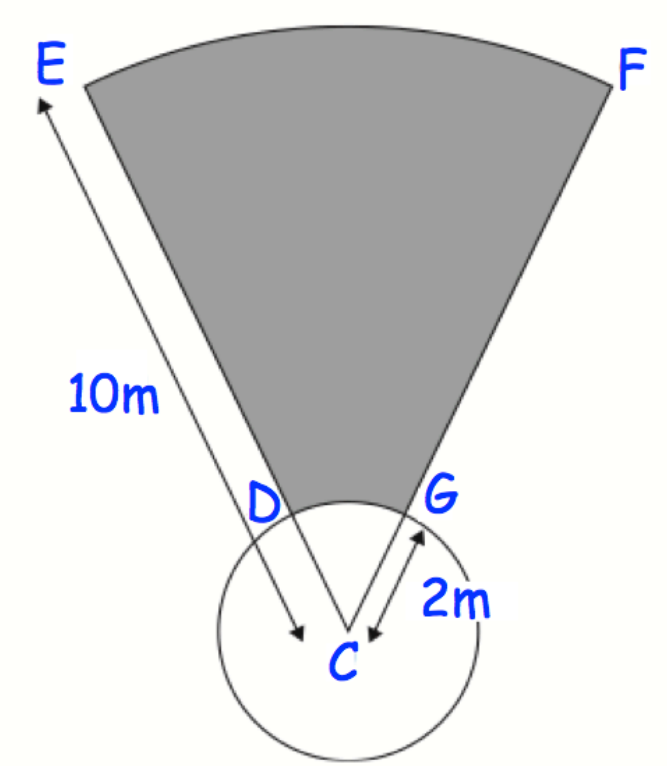
The perimeter of the sector is 1m.
Find the length of y, the radius of the circle.

.....cm
(4)

36. AREA OF A SECTOR (video 48)

The shot putt throwing area, on a school's sport field, is formed from the sectors of two circles with centre C.

The area of sector CDG is 1.2m².



Calculate the area of the shaded region.
Give your answer correct to 2 significant figures.