High School Mathematics Test 2015

Year 7

Angle Properties

Non Calculator Section

Name_____

Skills and Knowledge Assessed:

- Use the language, notation and conventions of geometry.
- Recognise the geometric properties of angles at a point.
- Identify corresponding, alternate and co-interior angles when two straight lines are crossed by a transversal (ACMMG163)
- Investigate conditions for two lines to be parallel and solve simple numerical problems using reasoning (ACMMG164)

Answer all questions in the spaces provided on this test paper by:

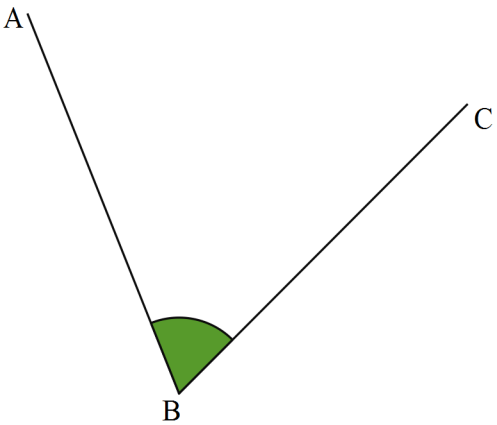
Writing the answer in the box provided.

or

Shading in the bubble for the correct answer from the four choices provided.

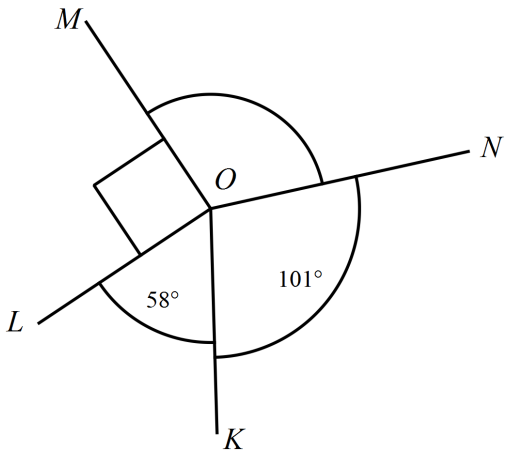
Show any working out on the test paper. Calculators are **not** allowed.

1. Use a protractor to measure the angle ABC.



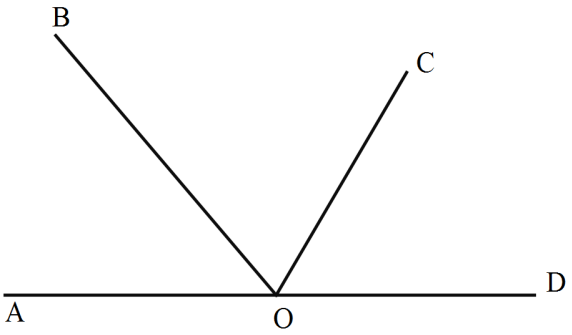
2. Four angles are marked, around a point *O*.

What is the size of ∠ MON.



o

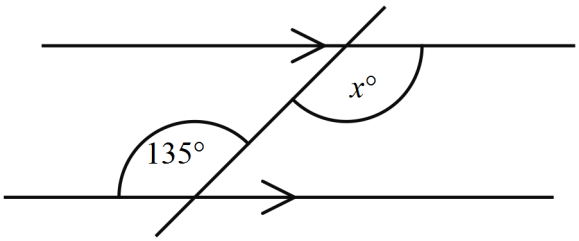
3. Which pair of angles are **not** adjacent angles?



- ☐ ∠ AOB and ∠ BOC.
- ☐ ∠ AOB and ∠ COD.
- ☐ ∠ AOB and ∠ BOD.
- ☐ ∠ AOC and ∠ COD.

4. What is the value of x?

$x =$ ☐



5. Use a protractor to draw ∠ PQR = 85°.

P Q

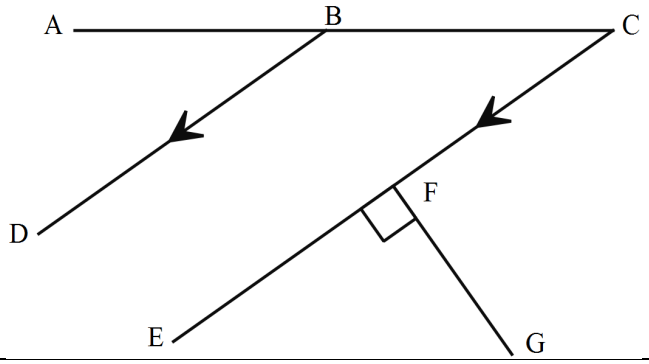
6. Which of the angles below would be described as a reflex angle?

- ☐ ∠ JNK = 120°
- ☐ ∠ JNL = 180°
- ☐ ∠ JNM = 300°
- ☐ ∠ KNK = 360°

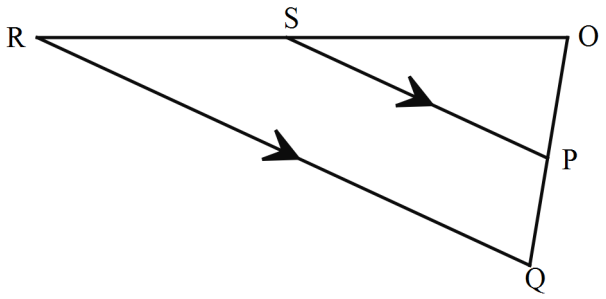
7. What is the complement of 65°?

- ☐ 25°
- ☐ 35°
- ☐ 115°
- ☐ 125°

8. Which line segment is parallel to BD and perpendicular to FG?



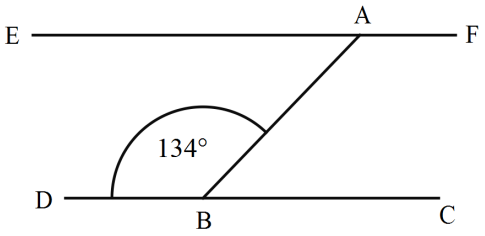
9. Name an angle which is equal to ∠ PQR.



10. Maree correctly worked out that ∠ ABC = 46°.

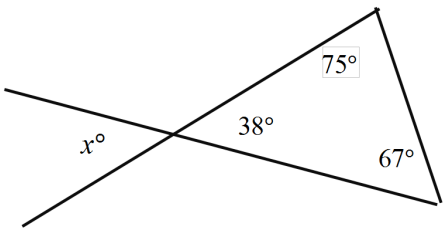
What type of angles allowed her to work this out?

- ☐ Alternate angles on parallel lines.
- ☐ Cointerior angles on parallel lines.
- ☐ Supplementary angles on a straight line.
- ☐ Vertically opposite angles meeting at a point.



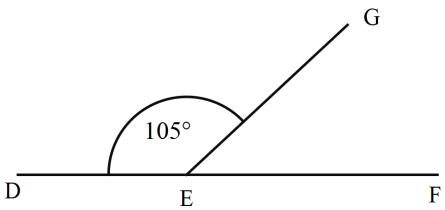
11. What is the value of x?

- ☐ 38°
- ☐ 67°
- ☐ 75°
- ☐ 142°



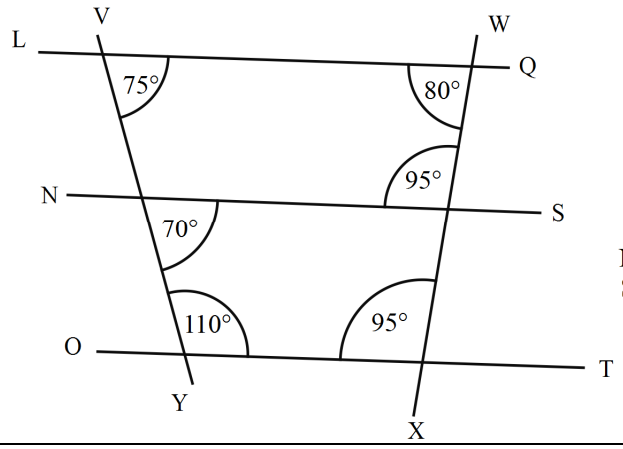
12. What is the size of ∠ GEF?

o



13. Name an interval which is ∥ to OT.

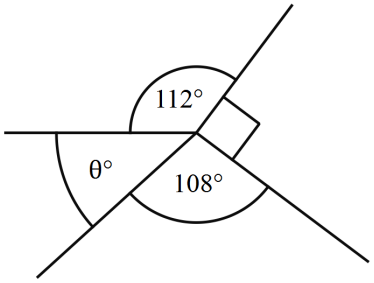
- ☐ LQ
- ☐ NS
- ☐ VY
- ☐ WX



NOT TO SCALE

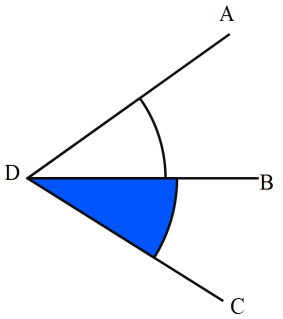
14. What is the value of θ ?

θ = ☐



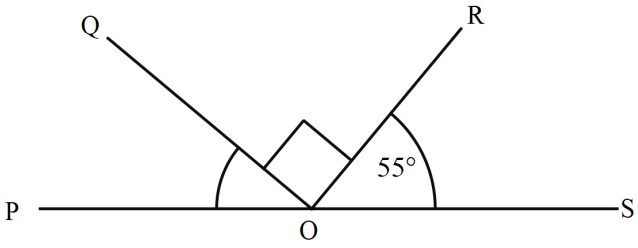
15. How could you describe the shaded angle?

- ☐ ∠ ADC
- ☐ ∠ ADB
- ☐ ∠ BDC
- ☐ ∠ *D*



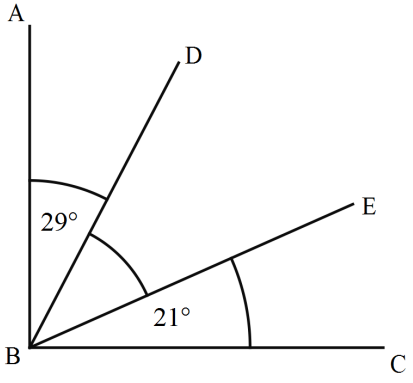
16. What is the size of ∠ QOP ?

☐



17. ∠ ABC is a right angle.
What is the size of ∠ DBE ?

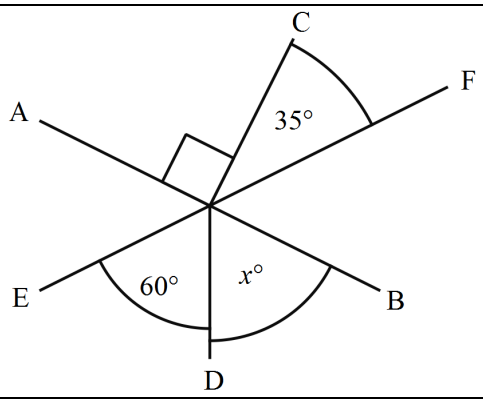
☐



18. AB and EF are straight lines.

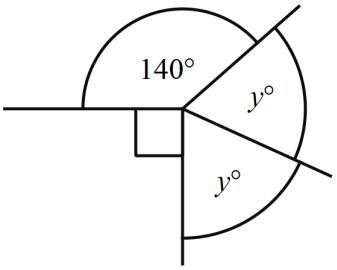
What is the value of x?

- ☐ 25°
- ☐ 35°
- ☐ 55°
- ☐ 65°



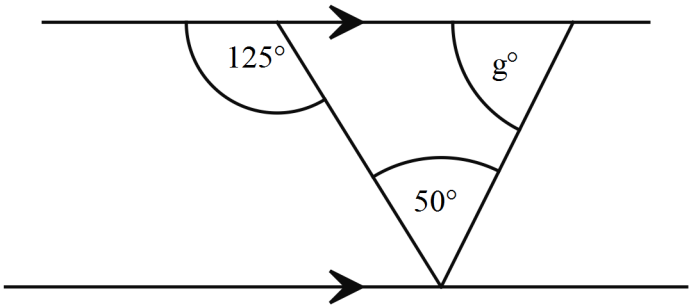
19. What is the value of y?

- ☐ 55°
- ☐ 65°
- ☐ 75°
- ☐ 130°



20. What is the value of g?

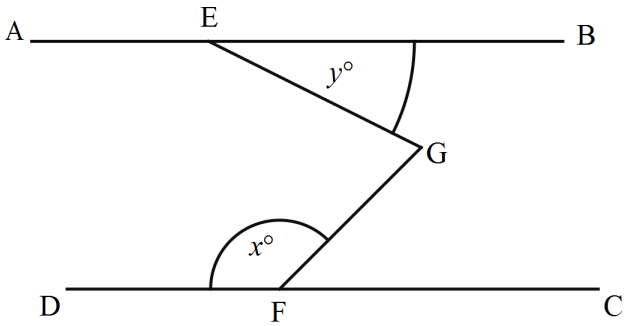
☐



21. $AB \parallel DC$.

$\angle$ EGF = ?

- ☐ $(x + y)°$
- ☐ $(x - y)°$
- ☐ $180° - (x + y)°$
- ☐ $180° - (x - y)°$



High School Mathematics Test 2015

Year 7

Angle Properties

Calculator Allowed Short Answer Section

Name_____

Answer all questions in the spaces provided on this test paper by:

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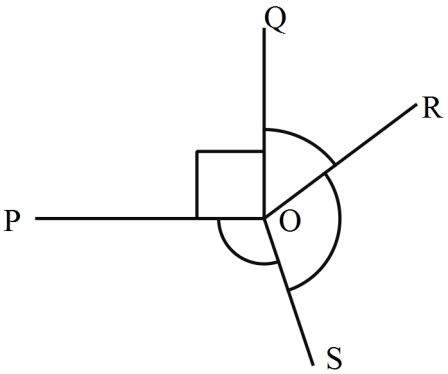
or

Shading in the bubble for the correct answer from the four choices provided.

Show any working out on this test paper. Calculators are allowed.

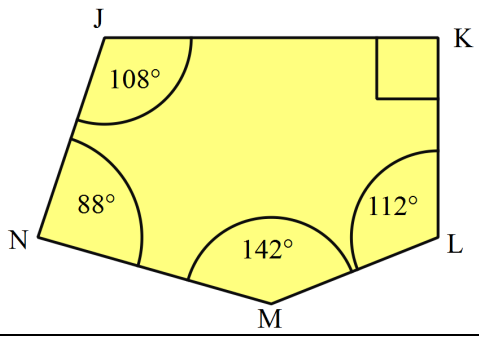
1. Name an acute angle in the diagram.



☐ ∠ POQ ☐ ∠ QOR

☐ ∠ ROS ☐ ∠ SOP

2. Which angle in the shape is a right angle?



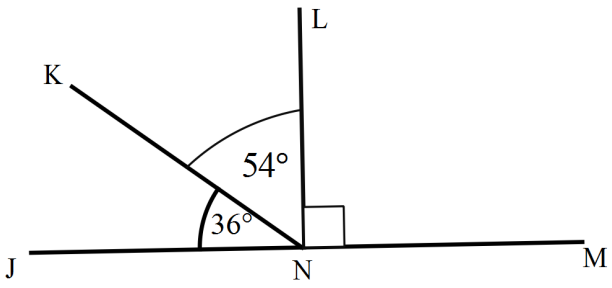
☐ ∠ JKL

☐ ∠ KLM

☐ ∠ LMN

☐ ∠ NJK

3. Which of the angles in the diagram is obtuse?



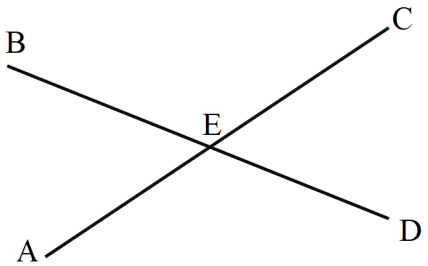
☐ ∠ JNK ☐ ∠ JNL

☐ ∠ JNM ☐ ∠ KNM

4. Which statement is true?

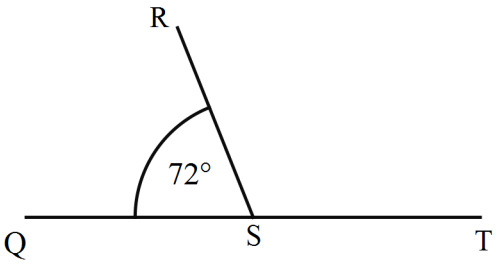
- ☐ 65° and 25° are supplementary angles.
- ☐ 65° and 35° are supplementary angles.
- ☐ 65° and 115° are supplementary angles.
- ☐ 65° and 45° are supplementary angles.

5. Which angles are a pair of vertically opposite angles?



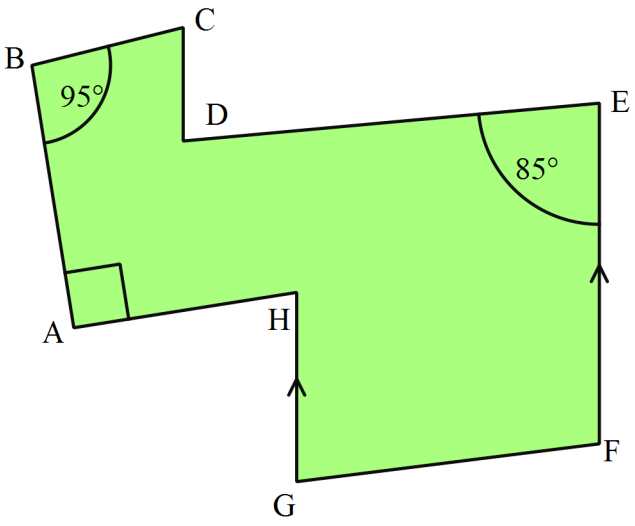
- ☐ ∠ BEA and ∠ AED
- ☐ ∠ BEC and ∠ CED
- ☐ ∠ BEC and ∠ AED
- ☐ ∠ CED and ∠ AED

6. What is the size of angle RST?



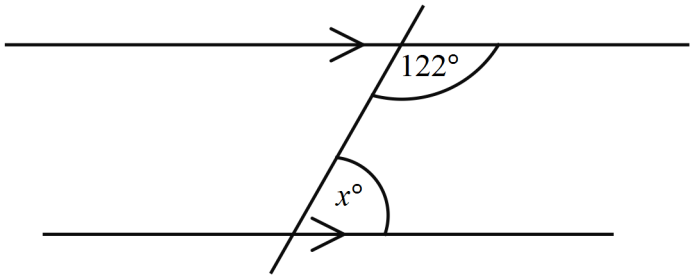
7. Which is correct?

- ☐ $CB \perp AB$
- ☐ $GH \perp EF$
- ☐ $HA \parallel BA$
- ☐ $HA \perp BA$



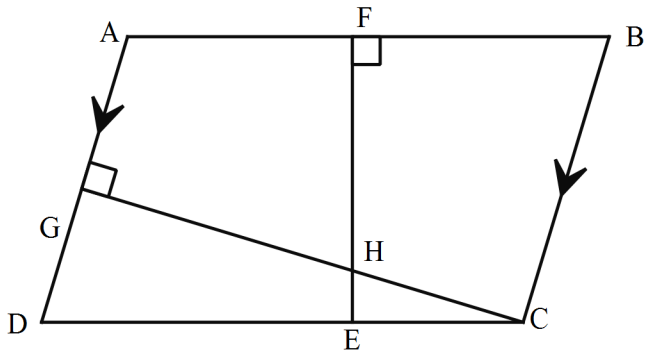
8. What is the value of x?

$x =$ ☐



9. Which line segment is parallel to BC and perpendicular to GC?

- ☐ AB
- ☐ AD
- ☐ DC
- ☐ FE



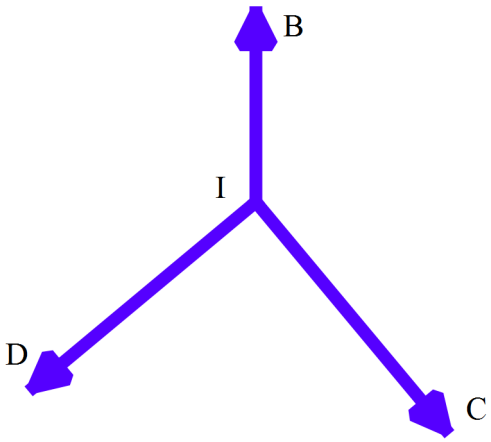
10. Three roads going to B, C and D, start from an intersection I.

The roads going to D and C meet at right angles.

The road going to B makes equal angles with the roads going to D and C.

What is the size of the angle BIC?

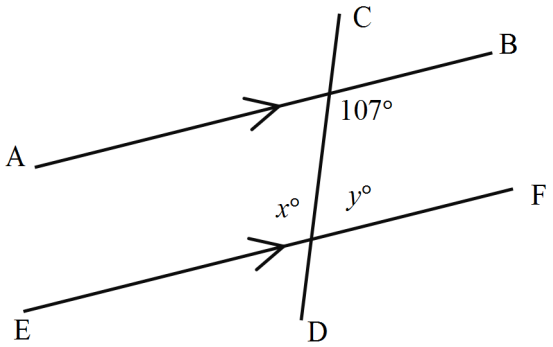
☐



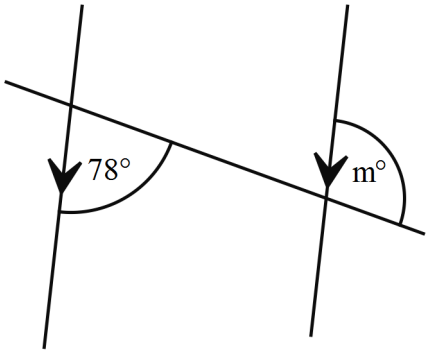
11. The lines AB and EF are parallel.

Which is true?

- ☐ $x = 73°$ and $y = 73°$.
- ☐ $x = 107°$ and $y = 73°$.
- ☐ $x = 73°$ and $y = 107°$.
- ☐ $x = 107°$ and $y = 107°$.



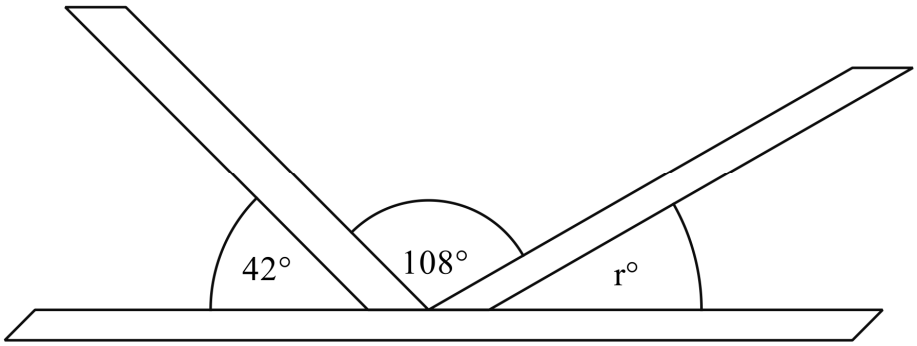
12. Find the value of m.



13. Three rafters join as shown in the diagram.

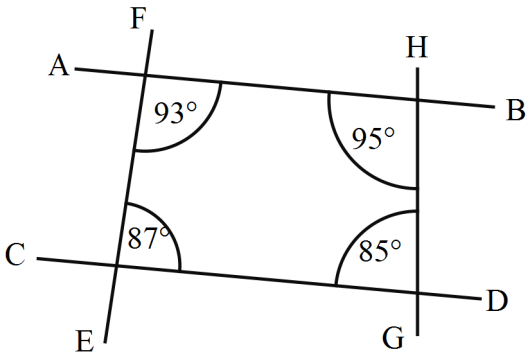
What is the value of r?

- ☐ 20°
- ☐ 30°
- ☐ 32°
- ☐ 42°



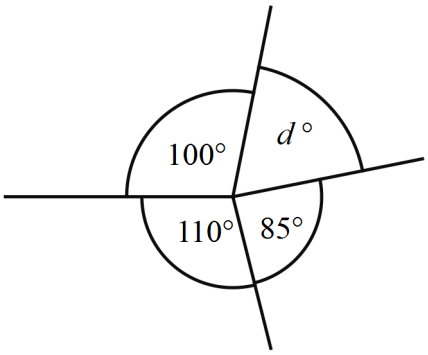
14. Which lines are parallel?

- ☐ AB and CD
- ☐ AB and HG
- ☐ CD and FG
- ☐ FE and HG

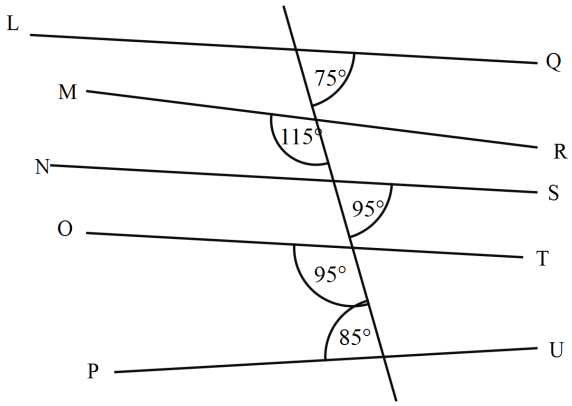


15. What is the value of d?

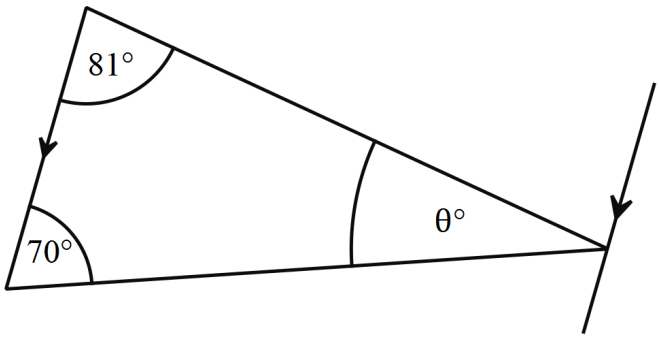
- ☐ 55°
- ☐ 65°
- ☐ 75°
- ☐ 115°



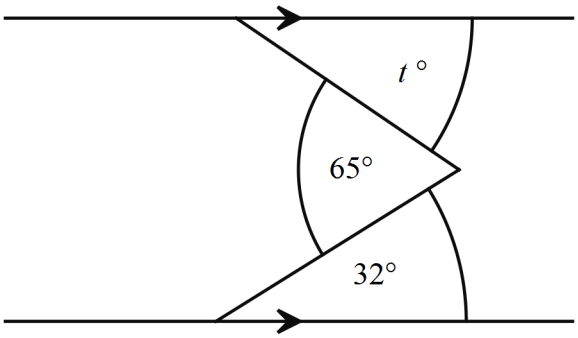
16. Name an interval which is ∥ to PU.



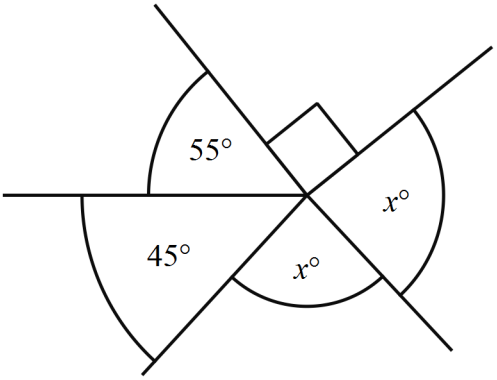
17. What is the value of θ?



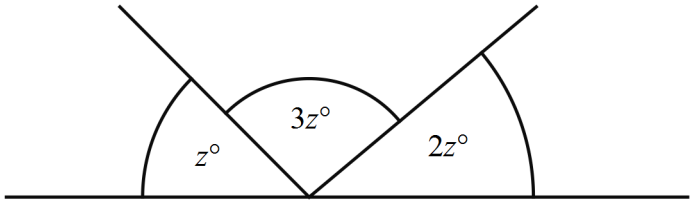
18. What is the value of t ?



19. What is the value of x?

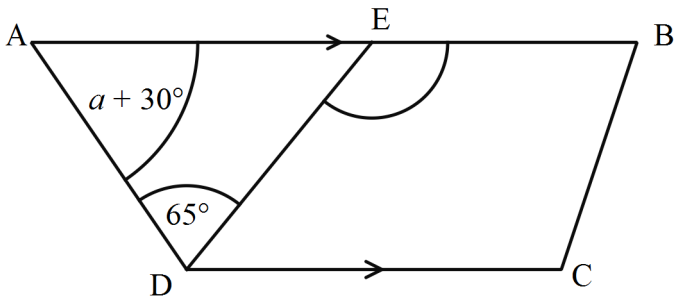


20. $z = ?$



- ☐ 25°
- ☐ 30°
- ☐ 36°
- ☐ 60°

21. What is the size of ∠ DEB?



- ☐ $85 - a$
- ☐ $85 + a$
- ☐ $95 - a$
- ☐ $95 + a$

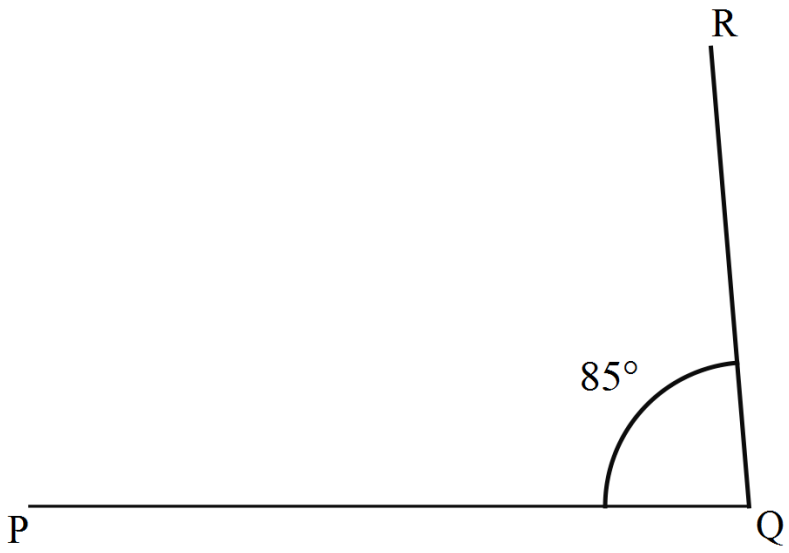
High School Mathematics Test 2015

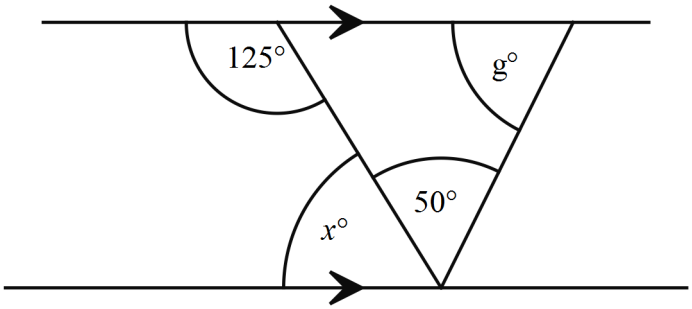
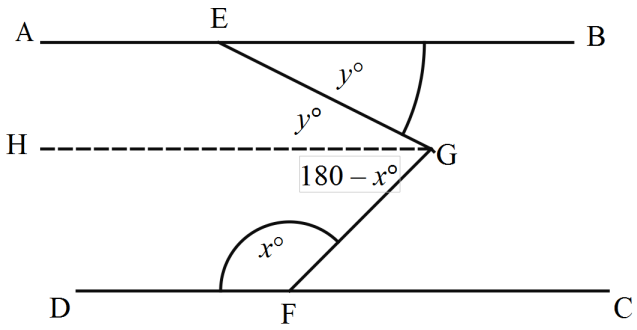
Year 7

Angle Properties

Non Calculator Section

ANSWERS

No.	WORKING	ANSWER
1.	Using protractor angle = 67^o	67^o (allow 2^o either side)
2.	∠ MON = 111°	111^o
3.	∠ AOB and ∠ COD have no common arm.	2nd Answer
4.	The two angles are alternate on parallel lines so are equal.	135
5.		
6.	Reflex is between 180^o and 360^o, so ∠ JNM = 300°	3rd Answer
7.	Compliment adds to form right angle so =90 – 65 = 25^o	1st Answer
8.	CE is parallel to BD and perpendicular to FG	Any of CE, EC, FC or FE
9.	∠ PQR and ∠ OPS are corresponding angles on ‖ lines so are equal.	∠ OPS
10.	∠ ABC and ∠ ABD are supplementary angles so ∠ *ABC* = 46°.	3rd Answer
11.	x = 38° (vertically Opposite angles)	1st answer
12.	∠ GEF = 180 – 105° = 75°	75°
13.	Need either equal corresponding angles or supplementary cointerior angles. NS gives both as 110 + 70 = 180	2nd answer

14.	$\theta = 360 - (108 + 112 + 90) = 360 - 310 = 50$	50
15.	$\angle$ BDC is the only unambiguous label .	3rd Answer
16.	$\angle$ QOP = $180 - (90 + 55) = 180 - 145 = 35°$	35°
17.	$\angle$ DBE = $90 - (29 + 21) = 90 - 50 = 40°$	40°
18.	AB and EF form vertically opposite angles which are equal. so $x + 60 = 90 + 35$ $x = 125 - 60$ $= 65$	4th Answer
19.	$y + y + 140 + 90 = 360$ (revolution) $2y + 230 = 360$ $2y = 360 - 230 = 130$ $y = \frac{130}{2} = 65$	2nd Answer
20.	 $x = 180 - 125 = 55$ $g = 180 - (55 + 50) = 180 - 105 = 75$ Different working is possible.	75°
21.	 Draw HG parallel to AB and DC $\angle$ EGH = y (alternate angles) $\angle$ HGF = $180 - x$ (cointerior angles) $\angle$ EGF = $y + 180 - x$ $= 180 - x + y$ $= 180 - (x - y)$	4th Answer

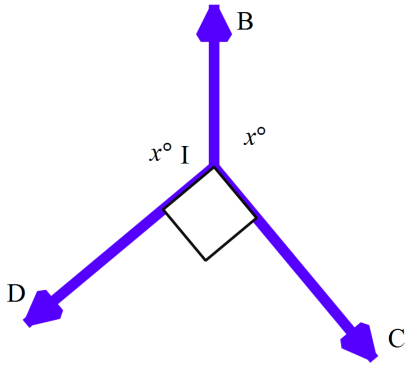
High School Mathematics Test 2015

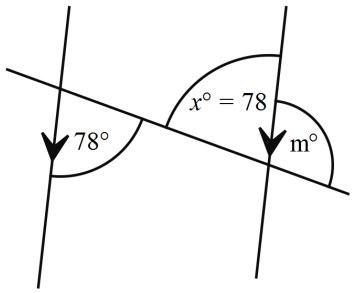
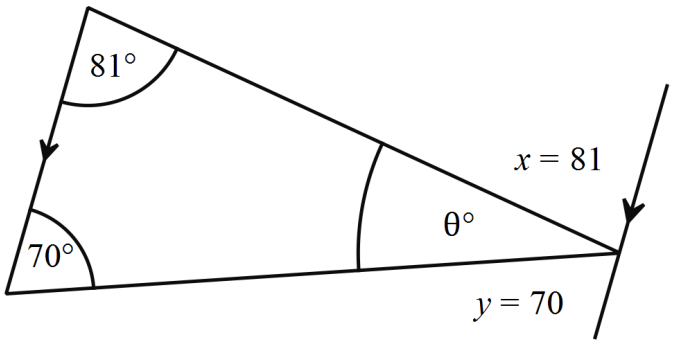
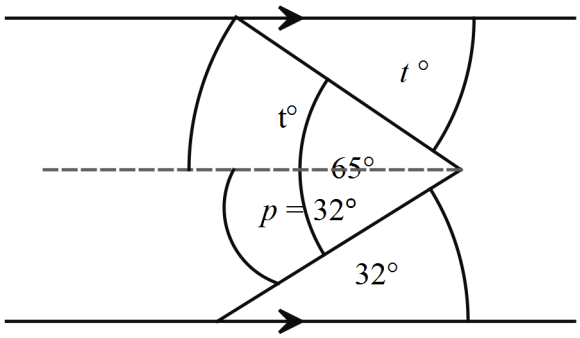
Year 7

Angle Properties

Calculator Allowed
Short Answer Section

ANSWERS

No.	WORKING	ANSWER
1.	∠ QOR is the only acute angle	2nd Answer
2.	∠ JKL is a right angle	1st Answer
3.	∠ KNM = 54° + 90° = 144° which is obtuse.	4th Answer
4.	65° and 115° are supplementary angles. (add to 180°)	3rd Answer
5.	∠ BEC and ∠ AED are vertically opposite angles.	3rd Answer
6.	∠ RST = 180° – 72° = 108°	108°
7.	$HA \perp BA$ since ∠ BAH = 90°	4th Answer
8.	x = 180 – 122 = 58° (cointerior angles)	58°
9.	AD is parallel to BC and perpendicular to GC	2nd Answer
10.	 $2x + 90 = 360$ $2x = 270$ $x = \frac{270}{2} = 135$	135°
11.	x= 107 (alternate angles) y = 73 (cointerior angles)	2nd Answer

12.	 $x = 78$ (alt angles) $m = 180 - 78$ (st line) $m = 102°$	102
13.	$r = 180 - (42 + 108) = 180 - 150 = 30$	2nd Answer
14.	All pairs of cointerior angles. The pairs between AB and CD are supplementary, so they are parallel.	1st Answer
15.	$d = 360 - (100 + 110 + 85) = 360 - 295 = 65$	2nd Answer
16.	Need either equal alternate angles or supplementary cointerior angles. OT gives the latter as 95 + 85 = 180	OT
17.	 $x = 81$ (alt angles) $y = 70$ (alt angles) $\theta = 180 - 81 - 70$ (st line) $= 29$ Can do by angle sum triangle if they have learnt it.	29o
18.	 Pairs of equal alternate angles are t` and 32° so $t + 32 = 65$ $t = 65 - 32 = 33°$	33o

19.	$2x + 45 + 55 + 90 = 360$ (angles at a point) $2x + 190 = 360$ $2x = 360 - 190 = 170$ $x = \frac{170}{2} = 85$	85^o
20.	$z + 2z + 3z = 180$ $6z = 180$ $z = \frac{180}{6} = 30$	2nd Answer
21.	$\angle ADC = 180 - (a + 30) = 150 - a$ $\angle EDC = 150 - a - 65 = 85 - a$ $\angle DEB = 180 - (85 - a) = 180 - 85 + a = 95 + a$	4th Answer