School Name
Mathematics Test 2017

Year 7

Angle Properties

Non Calculator Section

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)

Name_____

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

Writing the answer in the box provided.

or

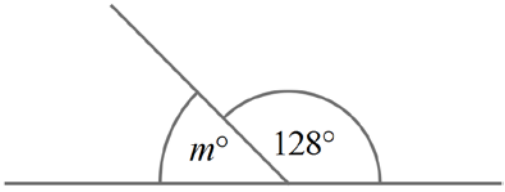
Shading in the bubble for the correct answer from the four choices provided.

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

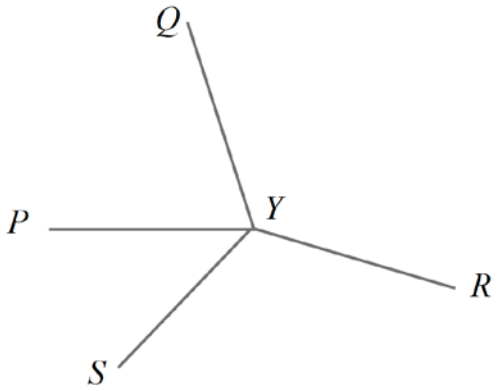
A protractor and ruler are needed for this test.

1. Use a protractor to help draw and label an angle *STU*, which measures 38°.

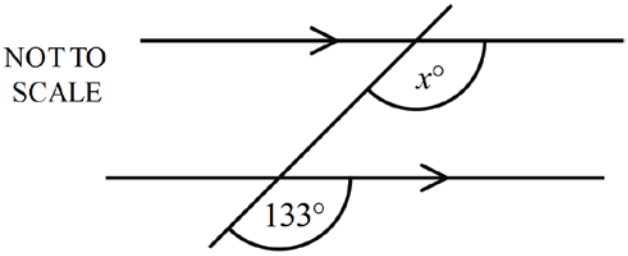
2. What is the value of m.



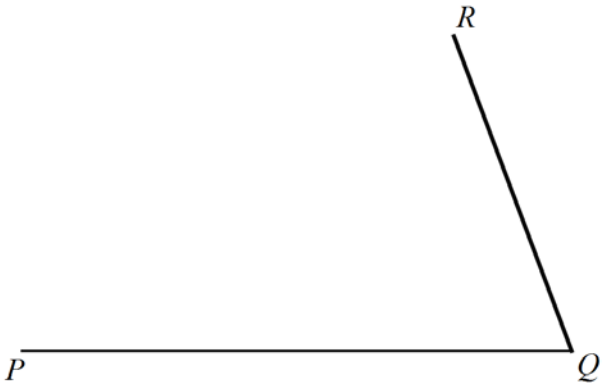
3. Name one of the angles which is adjacent to $\angle PYS$.



4. What is the value of x?



5. Use a protractor measure $\angle PQR$.



6. $\angle A = 28°, \angle B = 123°, \angle C = 180°$ and $\angle D = 240°$.

Which is true?

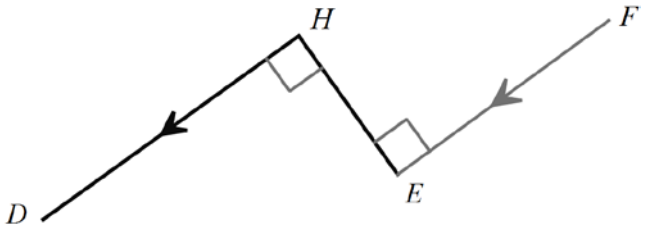
- ☐ $\angle$ A is an acute angle and $\angle B$ is an obtuse angle.
- ☐ $\angle$ A is an acute angle and $\angle C$ is an obtuse angle.
- ☐ $\angle B$ is an obtuse angle and $\angle C$ is a reflex angle.
- ☐ $\angle C$ is a straight angle and $\angle D$ is an obtuse angle.

7. What is the supplement of 85°?

☐ 5° ☐ 85° ☐ 95° ☐ 105°

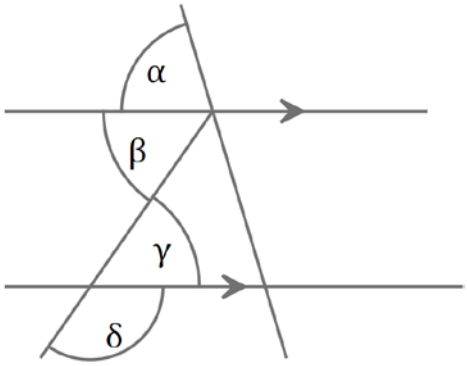
8. Name a pair of perpendicular lines in the diagram.

☐ and ☐



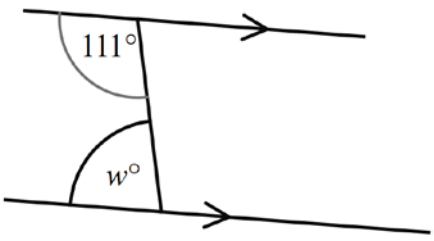
9. Use a protractor to help draw and label an angle *LMK*, which measures 138°.

10. Which is a pair of equal angles in the diagram below.



- ☐ α and β
- ☐ α and γ
- ☐ β and γ
- ☐ β and δ

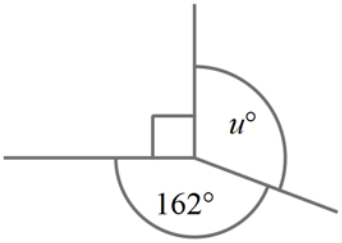
11. Which reason could be used to determine the value of *w*?



- ☐ Equal alternate angles on parallel lines.
- ☐ Equal corresponding angles on parallel lines.
- ☐ Supplementary alternate angles on parallel lines.
- ☐ Supplementary cointerior angles on parallel lines.

12. What is the value of u?

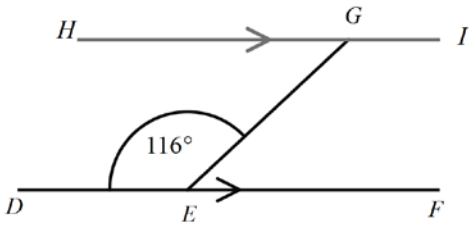
- ☐ $u = 18°$
- ☐ $u = 108°$
- ☐ $u = 162°$
- ☐ $u = 198°$



NOT TO SCALE

13. What is the size of $\angle IGE$?

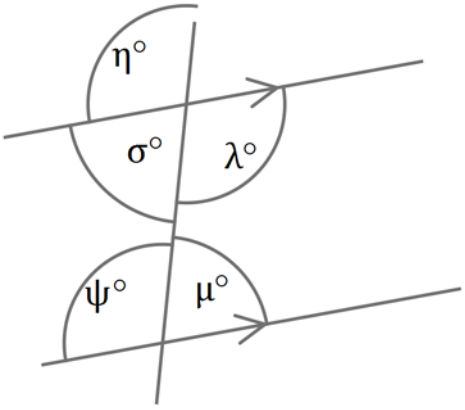
☐



NOT TO SCALE

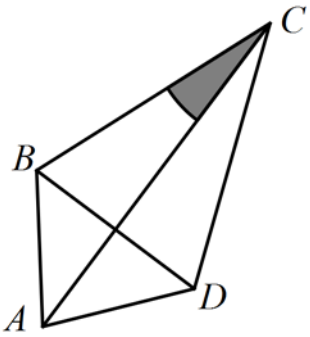
14. Which is **not** a pair of supplementary angles on the

- ☐ μ and σ
- ☐ ψ and σ
- ☐ λ and μ
- ☐ η and σ



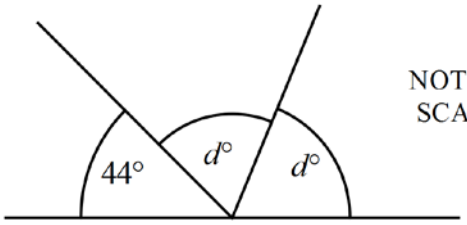
15. How could you describe the shaded angle?

- ☐ $\angle BCD$
- ☐ $\angle ACD$
- ☐ $\angle BCA$
- ☐ $\angle C$



16. What is the value of d ?

☐

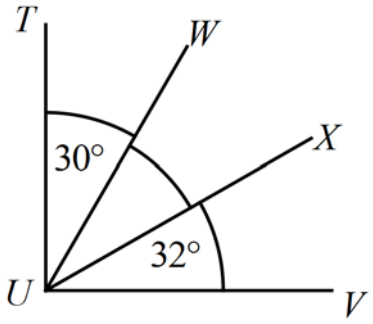


NOT TO SCALE

17. $\angle TUV$ is a right angle.

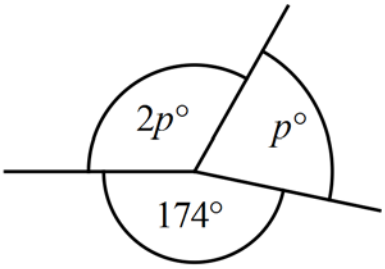
What is the size of $\angle WUX$?

NOT TO SCALE



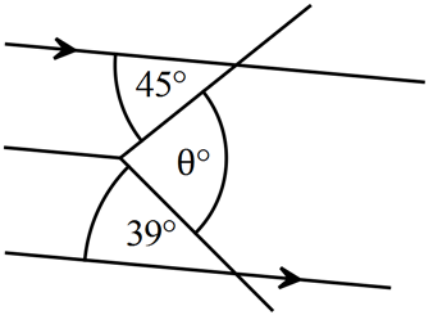
18. What is the value of p?

- ☐ $p = 31$
- ☐ $p = 62$
- ☐ $p = 93$
- ☐ $p = 186$



NOT TO SCALE

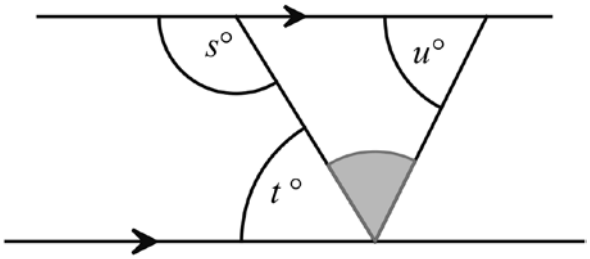
19. What is the value of θ ?



NOT TO SCALE

20. What is an expression for the shaded angle?

- ☐ $(s + u)°$
- ☐ $(t - u)°$
- ☐ $(s - u)°$
- ☐ $180° - (s + t)°$



School Name
Mathematics Test 2017

Angle Properties

Year 7

Calculator Allowed
Short Answer Section

Name_____

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

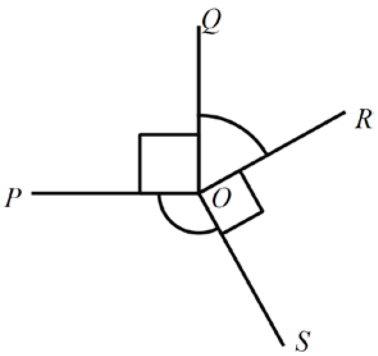
Writing the answer in the box provided.

or

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

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

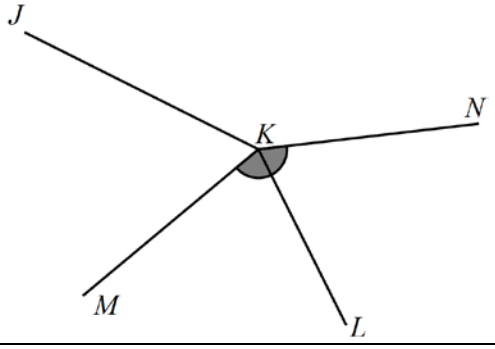
1. Which best describes the types of angles around point *O*.



- ☐ There are two acute angles, a right angle and an obtuse angle.
- ☐ There are two acute angles, an obtuse angle and a reflex angle.
- ☐ There are two right angles, an acute angle and an obtuse angle.
- ☐ There are two right angles, an obtuse angle and a reflex angle.

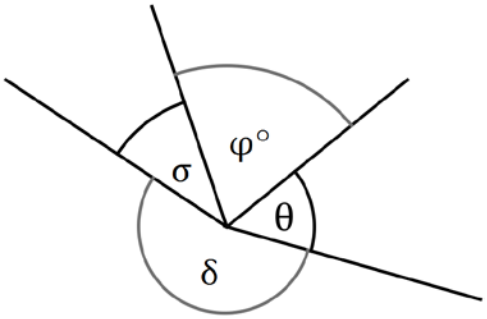
2. What name could be used to describe the shaded angle?

- ☐ $\angle JKL$
- ☐ $\angle LKN$
- ☐ $\angle MKL$
- ☐ $\angle MKN$



3. Which of these angles is a reflex angle?

- ☐ $\angle \delta$
- ☐ $\angle \sigma$
- ☐ $\angle \varphi$
- ☐ $\angle \theta$

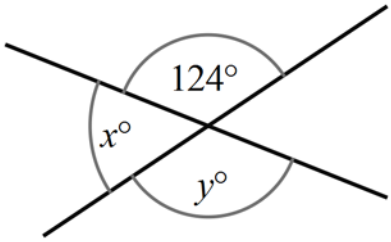


4. Which statement is true?

- ☐ 38° is the supplement of 52°.
- ☐ 38° is the supplement of 142°.
- ☐ 38° is the complement of 62°.
- ☐ 38° is the complement of 142°.

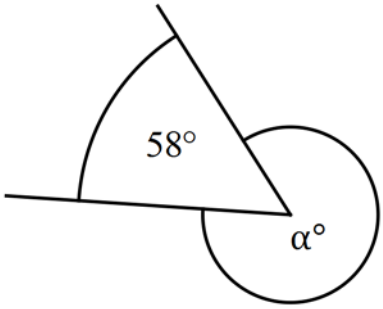
5. Which is true?

- ☐ $x = 56$ and $y = 56$
- ☐ $x = 56$ and $y = 124$
- ☐ $x = 124$ and $y = 56$
- ☐ $x = 124$ and $y = 124$



NOT TO SCALE

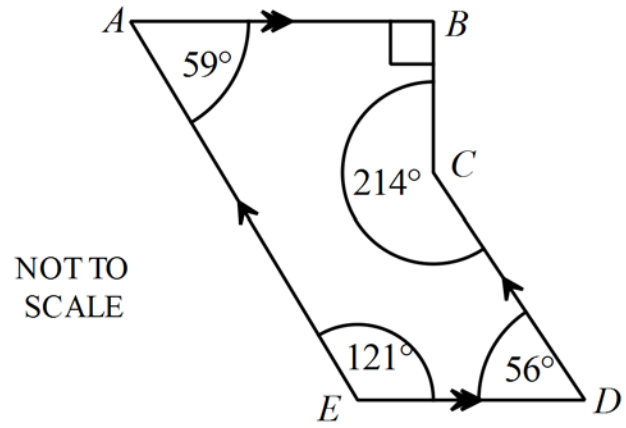
6. What is the value of α ?



NOT TO SCALE

7. Which side is parallel to *ED* and perpendicular to *BC*?

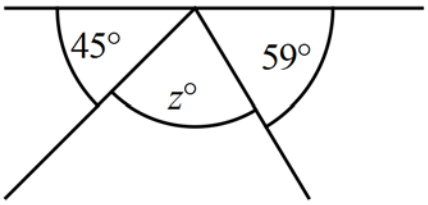
- ☐ *AB*
- ☐ AE
- ☐ CD
- ☐ DA



NOT TO SCALE

8. What is the value of *z*?

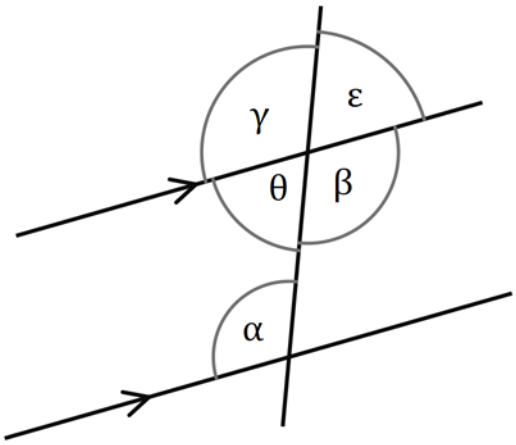
☐



NOT TO SCALE

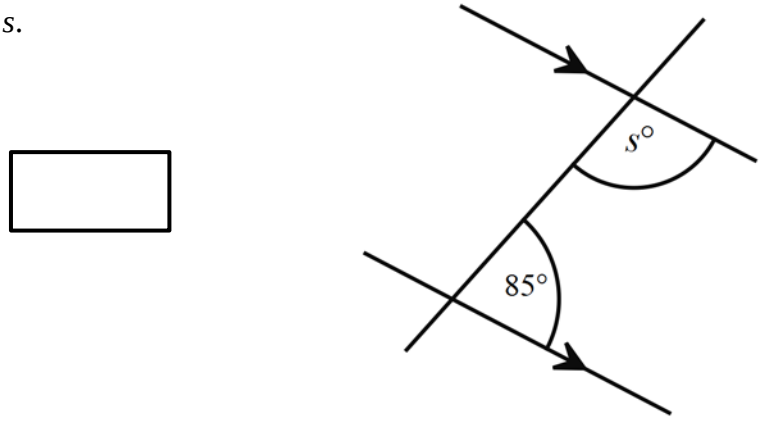
9. Which angle forms a pair of equal alternate angles with angle α?

- ☐ *β*
- ☐ *γ*
- ☐ *ε*
- ☐ *θ*



NOT TO SCALE

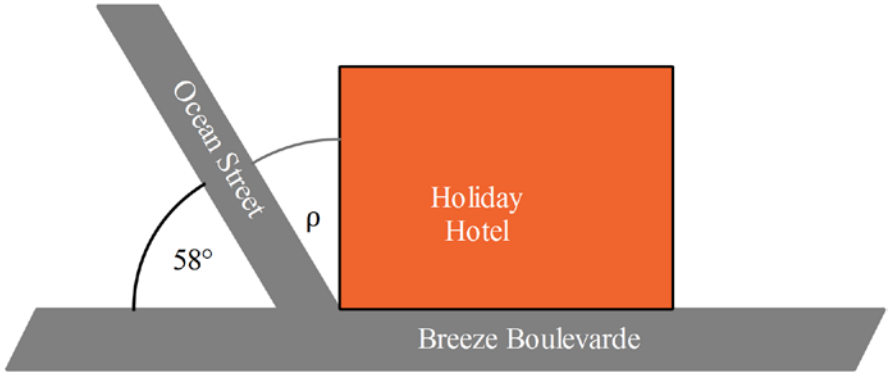
10. Find the value of *s*.



11. The Holiday Hotel is a rectangular building on the corner of Breeze Boulevarde and Ocean Street.

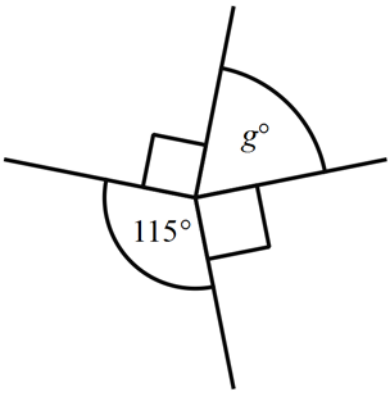
What is the size the angle marked ρ?

- ☐ 22°
- ☐ 28°
- ☐ 32°
- ☐ 122°

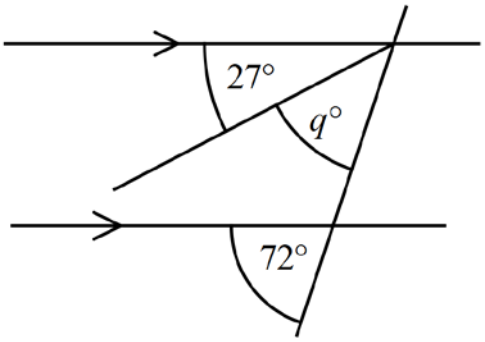


12. What is the value of *g*?

- ☐ 55°
- ☐ 65°
- ☐ 75°
- ☐ 115°



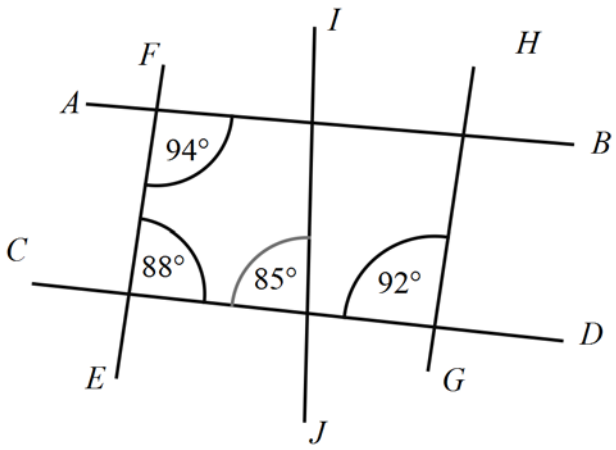
13. What is the value of q?



NOT TO SCALE

14. Which lines are parallel?

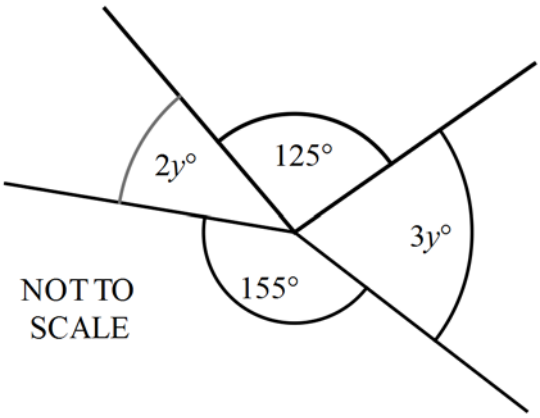
- ☐ *AB* and *CD*
- ☐ *FE* and *IJ*
- ☐ *FE* and *HG*
- ☐ *IJ* and *HG*



NOT TO SCALE

15. What is the value of y?

- ☐ $y = 8$
- ☐ $y = 16$
- ☐ $y = 20$
- ☐ $y = 32$



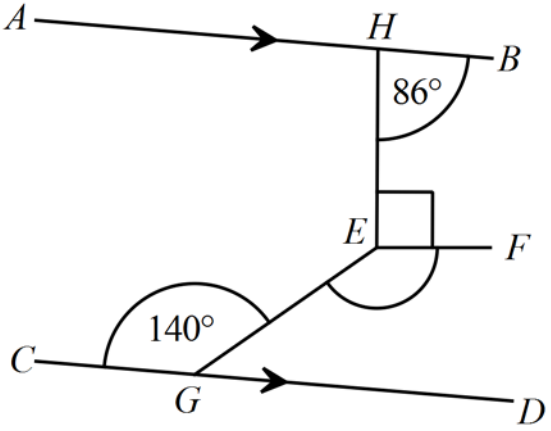
NOT TO SCALE

16. AB || CD and $HE \perp EF$.

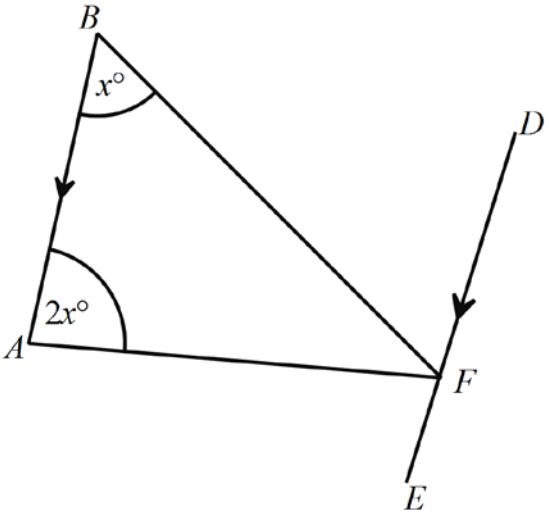
What is the size of $\angle GEF$?

- ☐ 117°
- ☐ 140°
- ☐ 144°
- ☐ 216°

NOT TO SCALE

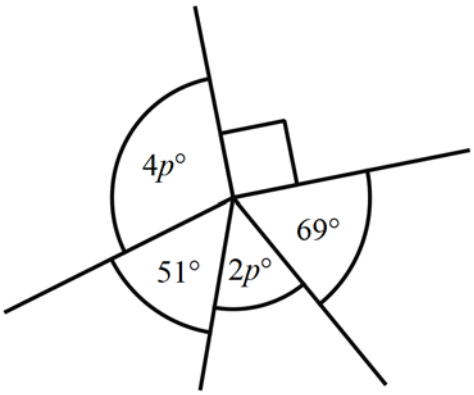


17. Write an expression for the size of $\angle AFB$ in terms of x.



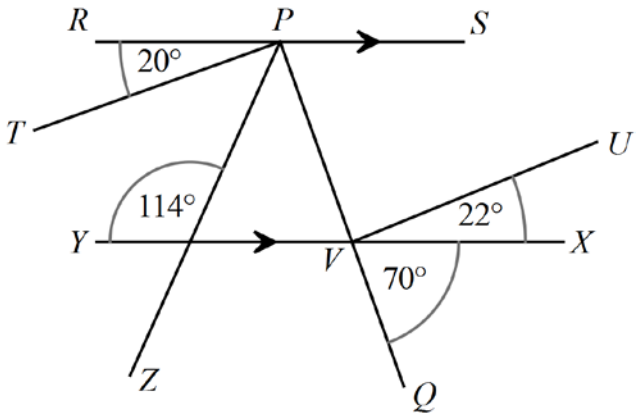
NOT TO SCALE

18. What is the value of p?

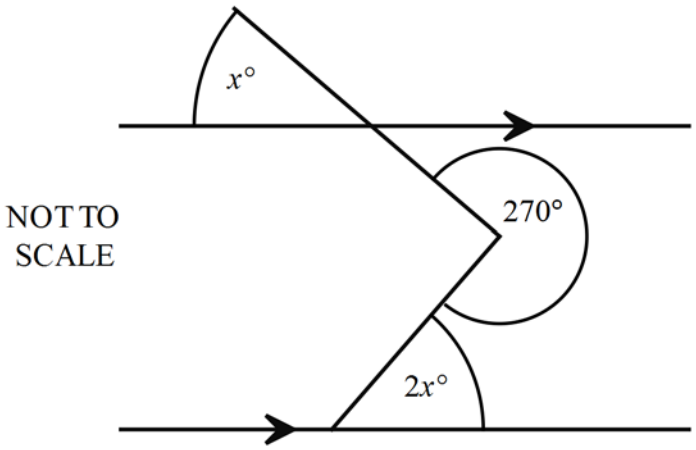


19. *RS* is parallel to *YX*.

Name an interval which is perpendicular to *PQ*.



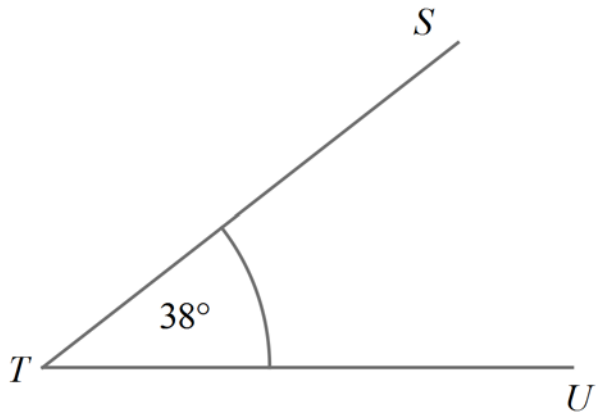
20. What is the value of x ?

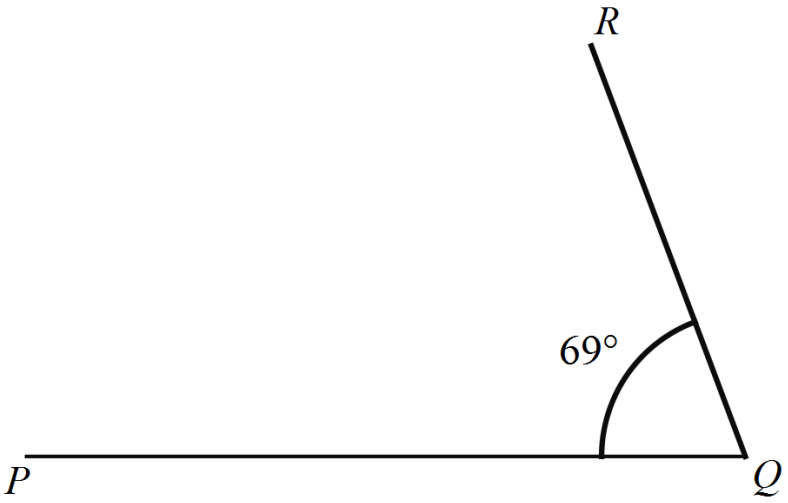
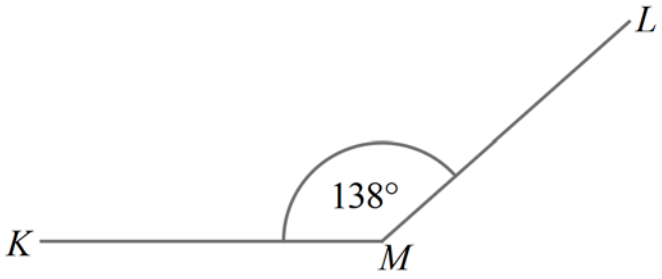


School Name
Mathematics Test 2017

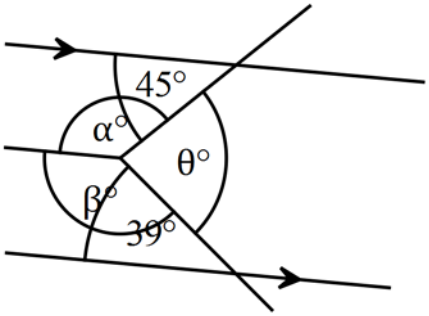
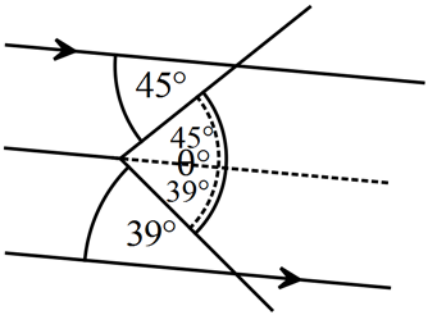
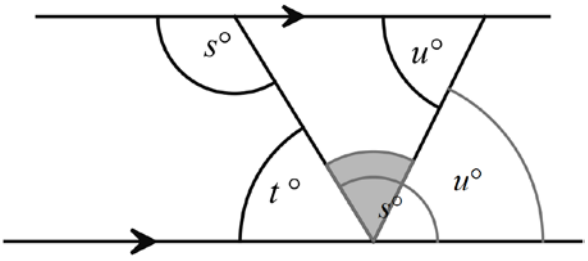
Year 7 **Angle Properties** Non Calculator Section

ANSWERS

Question	Working and Answer
1.	 Accurately drawn and labelled ngle
2.	$m + 128 = 180$ (angles on st line) $m = 180 - 128$ $\boldsymbol{m = 52}$
3.	$\angle PYQ$ or $\angle SYR$ have a common arm with $\angle PYS$. $\boldsymbol{\angle PYQ}$ **or** $\boldsymbol{\angle SYR}$
4.	$\boldsymbol{x = 133}$ (equal corresponding angles on $\parallel$ lines)

Question	Working and Answer
5.	 Allow one degree either way.
6.	$\angle A = 28°$ *is* an Acute angle $\angle B = 123°$ is an Obtuse angle $\angle C = 180°$ is a Straight angle $\angle D = 240°$ is a Reflex angle Only the first statement is correct **1st Answer**
7.	Supplementary angles add to 180° 85° + its supplement = 180° Supplement = 180° – 85° Supplement is 95°
8.	*HE* and *EF* or *HE* and *HD*
9.	 Allow one degree either way.

Question	Working and Answer
10.	$\angle \beta$ and $\angle \gamma$ are alternate angles on $\parallel$ lines so are equal. **3rd Answer**
11.	w` and 111 are cointerior angles` so they are supplementary Supplementary cointerior angles on parallel lines **4th Answer**
12.	$u + 162 + 90 = 360°$ (angles at a point) $u = 360 - 252$ $u = 108$ **2nd Answer**
13.	$\angle IGE = 116°$ (Alternate angles) **116º**
14.	μ and σ are alternate angle so are **equal, not supplementary** ψ and σ are cointerior angles so are supplementary λ and μ are cointerior angles so are supplementary η and σ are angles on a straight line so are supplementary 1st Answer
15.	$\angle BCA$ is the only unambiguous description. **3rd Answer**
16.	$2d + 44 = 180$ $2d = 180 - 44$ $2d = 136$ $d = 136 \div 2$ $\boldsymbol{d = 68}$
17.	$\angle WUX + 32° + 30° = 90°$ (complementary angles) $\angle WUX + 62° = 90°$ $\angle WUX = 90° - 62°$ $\boldsymbol{\angle WUX = 28°}$

Question	Working and Answer
18.	$2p + p + 174 = 360$ (angles at a point) $3p + 174 = 360$ $3p = 360 - 174$ $3p = 186$ $p = \frac{186}{3}$ $p = 62$ **2nd Answer**
19.	Different methods are possible (2 shown).  $\alpha = 180 - 45 = 135$ (cointerior ∠) $\beta = 180 - 39 = 141$ (cointerior ∠) $\theta = 360 - (141 + 135) = 360 - 276$ θ **= 84**
	 Extend centre line This gives angles (shown) of 45° and 39°(alternate ∠) $\theta = 45 + 39$ θ **= 84**
20.	 Find equal angles s and u as shown using alternate angles shaded angle = $s - u$ **3rd Answer**

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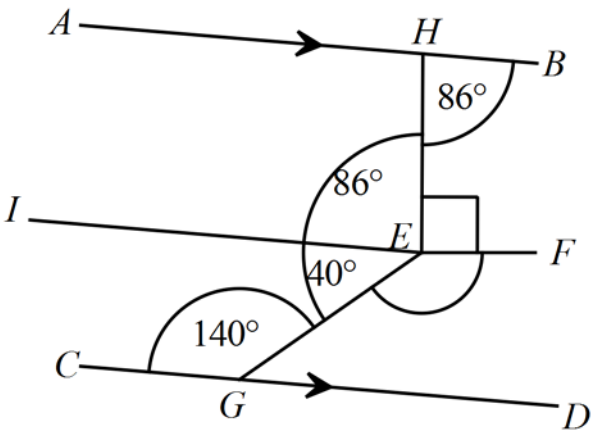
ANSWERS

Question	Working and Answer
1.	$\angle POQ$ and $\angle SOR$ are right, $\angle POS$ is the only obtuse angle and $\angle QOR$ the only acute angle **3rd Answer**
2.	$\angle MKN$ is the shaded angle **4th Answer**
3.	$\angle \delta$ is more than 180° which is reflex. **1st Answer**
4.	38° is the supplement of 142° since $38 + 142 = 180$ **2nd Answer**
5.	$y = 124$ (vertically opposite angles) $x = 56$ (angles on a straight line) **2nd Answer**
6.	$\alpha + 58 = 360$ (angles at a point) $\alpha = 360 - 58$ $\alpha = \mathbf{302}$
7.	$AB \parallel ED$ and $\perp BC$ **1st Answer**

8.	$z + 45 + 59 = 180$ (angles at a point) $z = 180 - 104$ $\boldsymbol{z = 76}$
9.	β is an alternate angle with α. **1st Answer**
10.	$s + 85 = 180$ (cointerior angles) $s = 180 - 85$ $\boldsymbol{s = 95}$
11.	Since the Hotel forms a right angle, the adjacent angles along Breeze Blvde also form a right angle $\rho + 58 = 90$ $\rho = 90 - 58$ $\rho = 32$ **3rd Answer**
12.	$g + 115 + 2 \times 90 = 360$ (angles at a point) $g + 295 = 360$ $g = 360 - 295$ $g = 65$ **2nd Answer**
13.	$q + 27 = 72°$ (corresponding angles) $q = 72 - 27$ $\boldsymbol{q = 45}$
14.	Between FE and HG there are a pair of cointerior angles that are supplementary (88^o and 92^o) so they are parallel. **3rd Answer**
15.	$2y + 3y + 125 + 155 = 360$ (angles at a point) $5y + 280 = 360$ $5y = 360 - 280$ $5y = 80$ $y = 80 \div 5$ $y = 16$ **2nd Answer**

16.



Join $IE \parallel$ to AB and CD.

$\angle IEG = 40°$ (Co-int angles)

$\angle IEH = 86°$ (alternate angles)

$\angle GEF + 40 + 86 + 90 = 360$ (angles at a point)

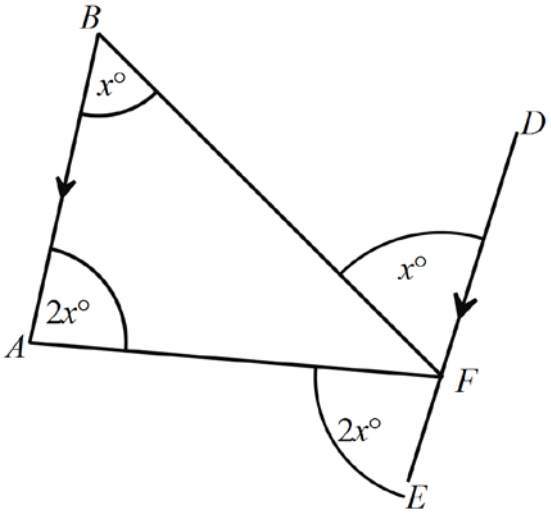
$\angle GEF + 216 = 360$

$\angle GEF = 360 - 216$

$\angle GEF = 144$

3rd Answer

17.



$\angle BFD = x°$ (alternate angles)

$\angle AFE = 2x°$ (alternate angles)

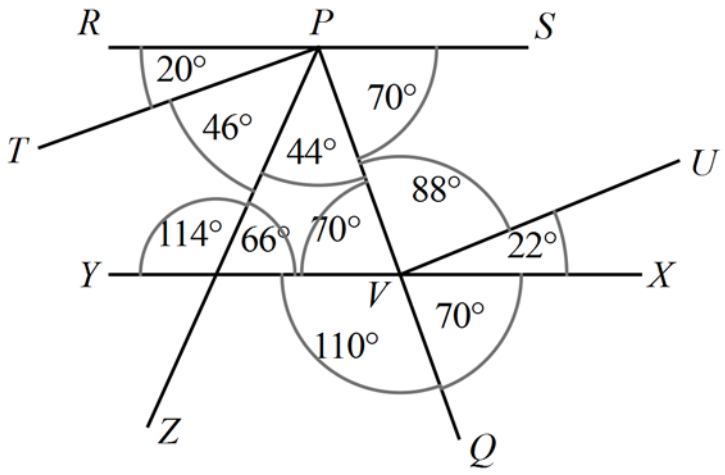
$\angle AFB + x + 2x = 180°$ (angles on a line)

$\boldsymbol{\angle AFB = (180 - 3x)°}$

18.

$$\begin{aligned} 2p + 4p + 69 + 51 + 90 &= 360 \text{ (angles at a point)} \\ 6p + 210 &= 360 \\ 6p &= 360 - 210 \\ 6p &= 150 \\ p &= 150 \div 6 \\ \boldsymbol{p} &= \mathbf{25} \end{aligned}$$

19.

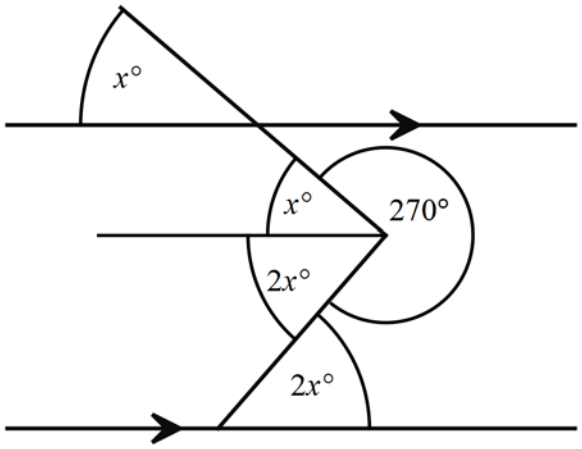


Resolving all of the angles around the segment PQ gives the diagram above.

$\angle TPQ = 46° + 44° = 90°$

So the line perpendicular to PQ is **TP.**

20.



complete alternate angles x and $2x$ as shown

$$\begin{aligned} 2x + x + 270 &= 360 \\ 3x + 270 &= 360 \\ 3x &= 360 - 270 \\ 3x &= 90 \\ \boldsymbol{x} &= \mathbf{30} \end{aligned}$$