High School Mathematics Test 2014

Year 7

Angle Properties

Non Calculator Section

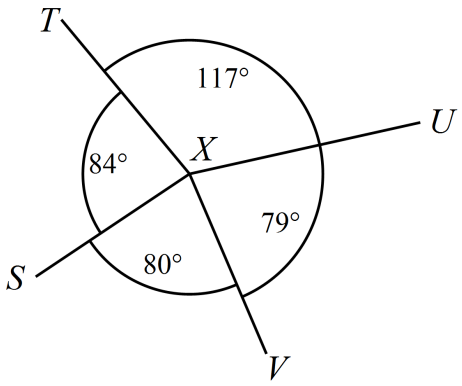
Skills and Knowledge Assessed:

- 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_____

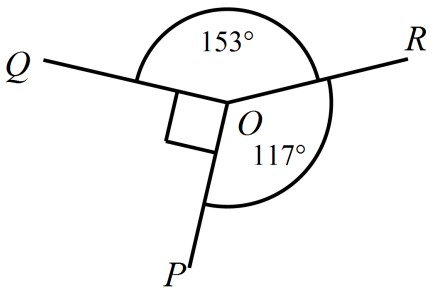
Answer all questions in the spaces provided on this test paper by:
Writing the answer in the box provided.
or
Shading in the bubble for the correct answer from the four choices provided.
Show any working out on the test paper. Calculators are ***not*** *allowed.*

1. Four angles are marked, around a point X.
What is the size of $\angle SXT$?



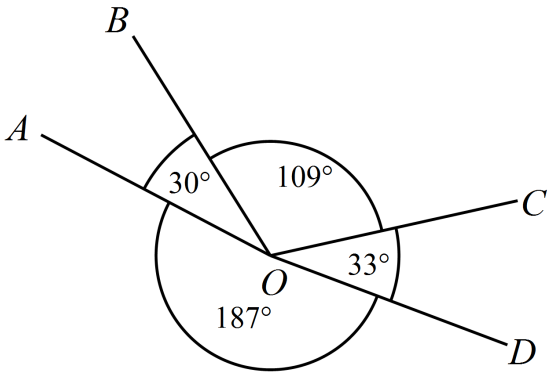
☐ °

2. Three angles are marked, around a point O.
What is the name of the angle which is a right angle?



☐ $\angle O$ ☐ $\angle POQ$
☐ $\angle ROQ$ ☐ $\angle POR$

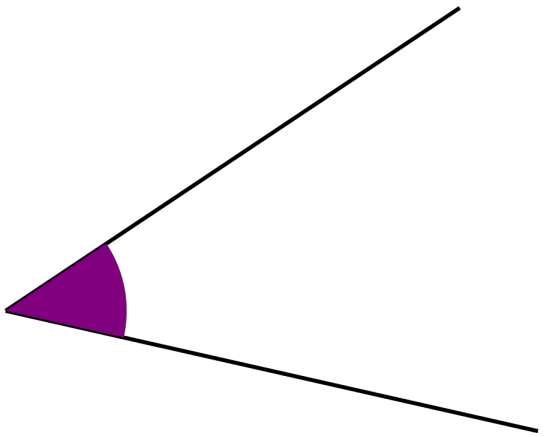
3. Four angles are marked, around a point O.
Which is **not** correct?



☐ $\angle AOB$ is an acute angle.
☐ $\angle BOC$ is an obtuse angle.
☐ $\angle AOD$ is an obtuse angle.
☐ $\angle COD$ is an acute angle.

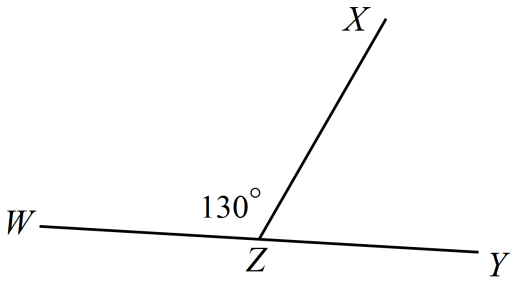
4. Measure the size of $\angle HIJ$ with a protractor.

$\angle HIJ =$ ☐ o



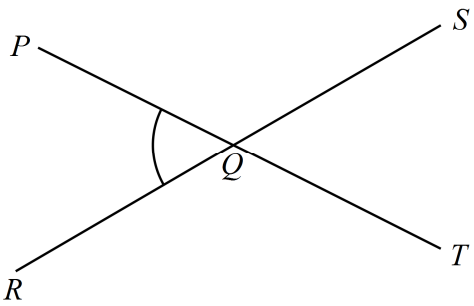
5. What is the size of $\angle XZY$?

$\angle XZY =$ ☐ o



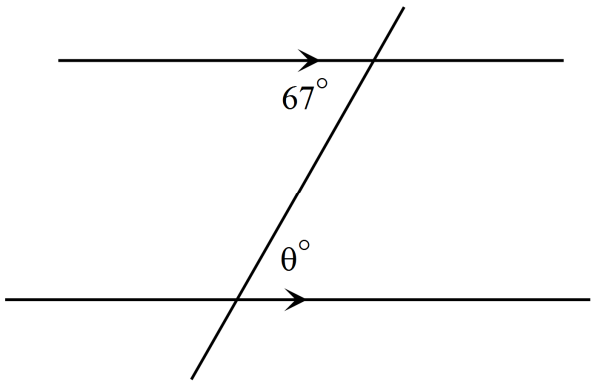
6. $\angle PQR$ = ?

- ☐ $\angle PQS$.
- ☐ $\angle RQT$.
- ☐ $\angle SQT$.
- ☐ $\angle SQP$.



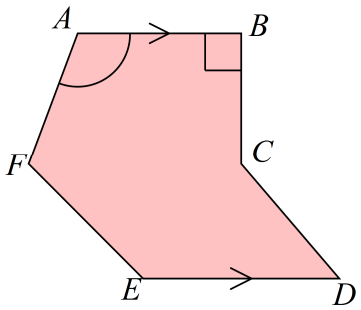
7. What is the value of θ?

$\theta =$ ☐



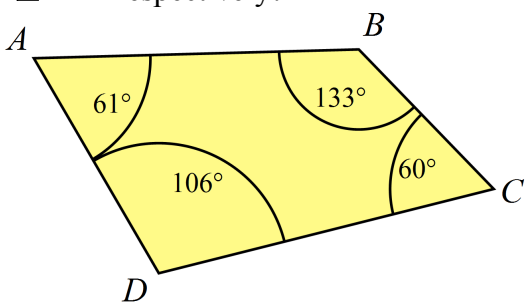
8. Which statement is true?

- ☐ $AB \,||\, EF$ and $AB \perp BC$.
- ☐ $AB \,||\, ED$ and $AB \perp BC$.
- ☐ $FE \,||\, CD$ and $AB \perp BC$.
- ☐ $AB \,||\, BC$ and $AB \perp ED$.



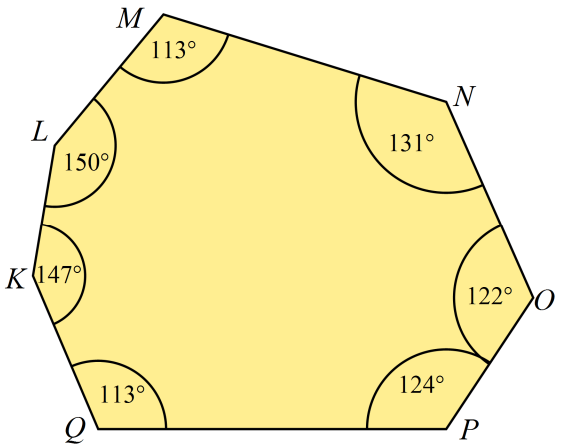
9. What are the sizes of the two angles $\angle ABC$ and $\angle CDA$ respectively?

- ☐ 60° and 61°.
- ☐ 60° and 106°.
- ☐ 133° and 61°.
- ☐ 133° and 106°.



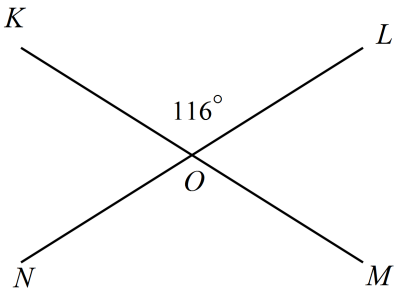
10. Name a pair of equal angles in the heptagon shown?

$\angle$ ☐ and $\angle$ ☐



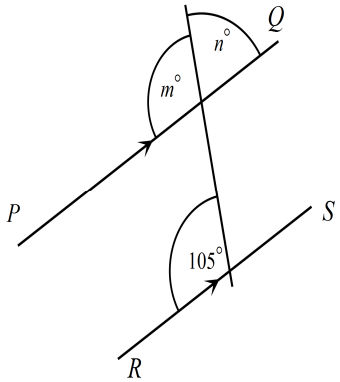
11. Regina was asked to find the size of $\angle MON$.
She correctly answered that it was 116°.
What was her reason?

- ☐ Adjacent angles are equal.
- ☐ Alternate angles are equal.
- ☐ Corresponding angles are equal.
- ☐ Vertically opposite angles are equal.



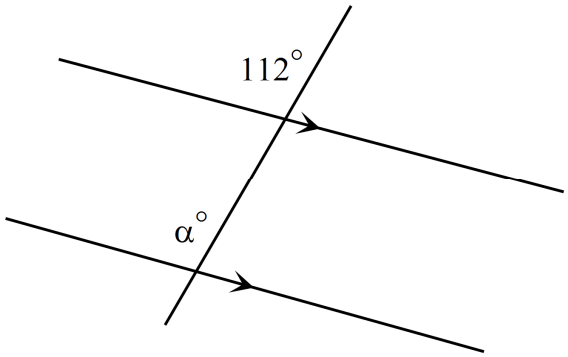
12. The lines PQ and RS are parallel. Which is true?

- ☐ $m = 75^\circ$ and $n = 75^\circ$
- ☐ $m = 75^\circ$ and $n = 105^\circ$
- ☐ $m = 105^\circ$ and $n = 75^\circ$
- ☐ $m = 105^\circ$ and $n = 105^\circ$



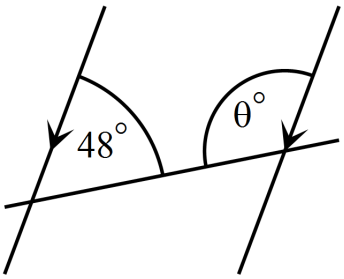
13. What is the value of α ?

α = ☐



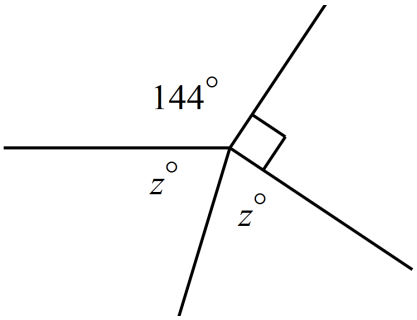
14. What is the value of θ ?

- ☐ $\theta = 42$
- ☐ $\theta = 48$
- ☐ $\theta = 52$
- ☐ $\theta = 132$



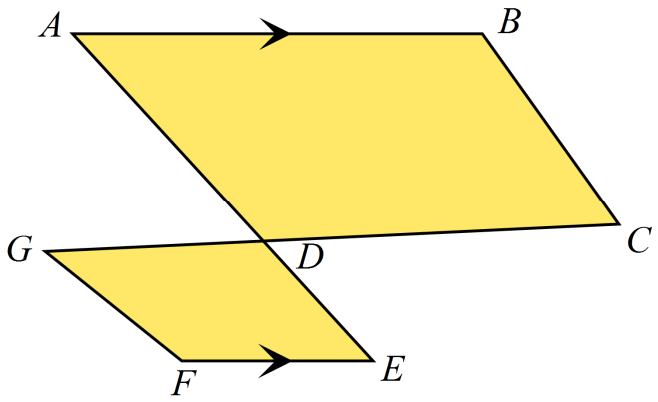
15. $z = ?$

- ☐ 63
- ☐ 72
- ☐ 117
- ☐ 144



16. Name a pair of vertically opposite angles in the diagram below.

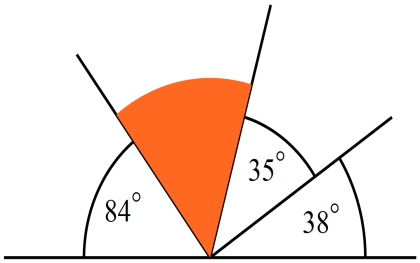
$\angle$ ☐ and $\angle$ ☐ .



17. What is the size of the shaded angle?

☐ 23° ☐ 73°

☐ 119° ☐ 157°



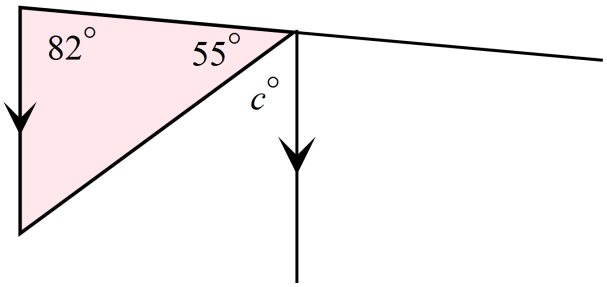
18. Find the value of c.

☐ $c = 27$

☐ $c = 43$

☐ $c = 55$

☐ $c = 137$



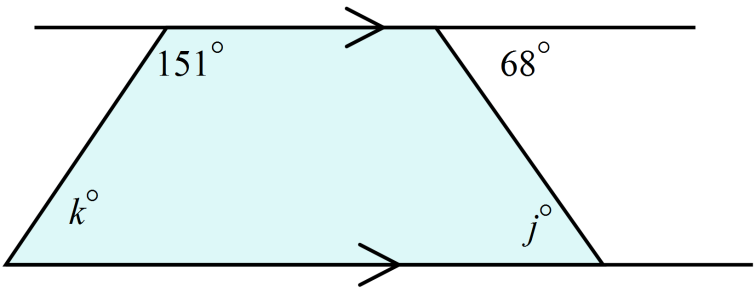
19. Which is true ?

☐ $j = 68$ and $k = 29$.

☐ $j = 68$ and $k = 151$.

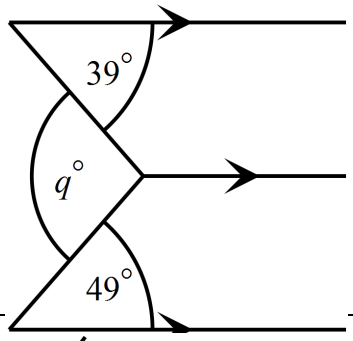
☐ $j = 112$ and $k = 29$.

☐ $j = 112$ and $k = 151$.



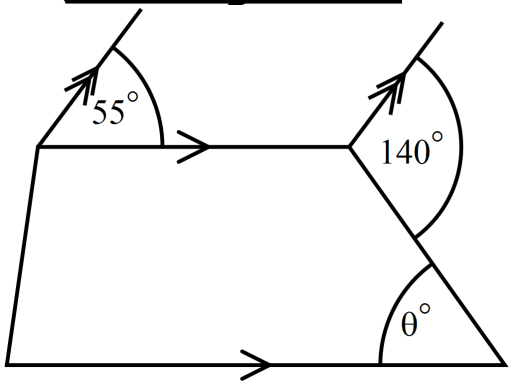
20. Find the value of q.

q = ☐



21. θ = ?

- ☐ 15°
- ☐ 85°
- ☐ 95°
- ☐ 125°



High School
Mathematics Test 2014

Year

Angle Properties

Calculator Allowed
Short Answer Section

Name_____

Answer all questions in the spaces provided on this test paper by:
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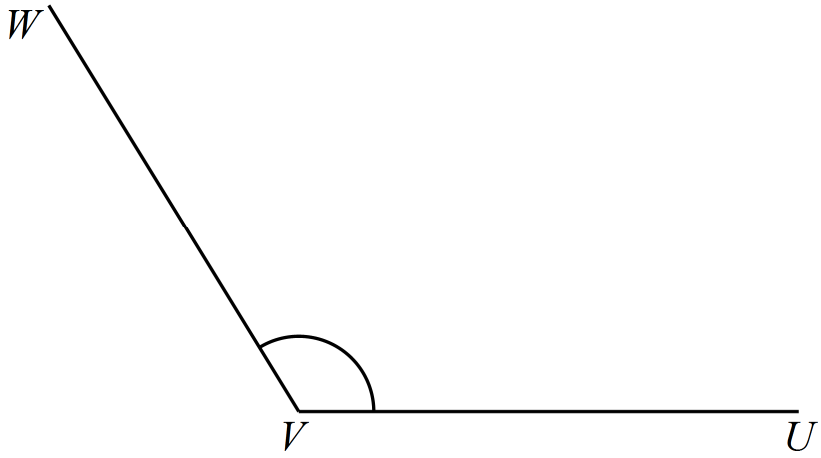
or
Shading in the bubble for the correct answer from the four choices provided.
Show any working out on the test paper. Calculators are allowed.

1. Use a protractor to measure the size of $\angle UVW$.

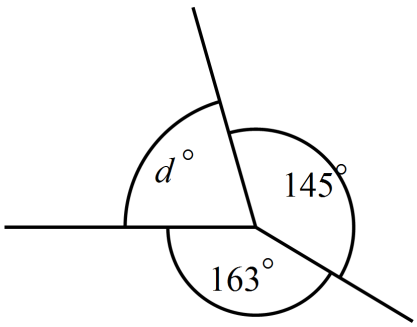


2. Complete the statement below.

Angles of 75° and ☐ ° are supplementary angles.

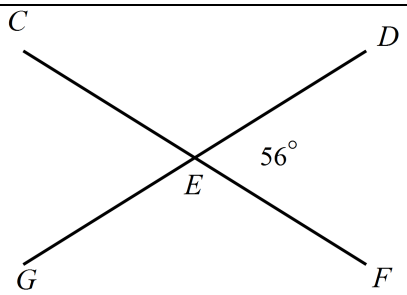
3. Find the value of d.

- ☐ $d = 52$
- ☐ $d = 72.$
- ☐ $d = 163$
- ☐ $d = 308$



4. Find the size of $\angle CED$. .

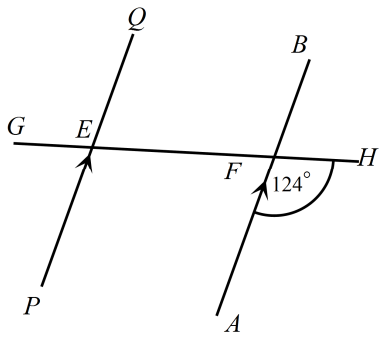
$\angle CED =$ ☐



5. PQ || AB

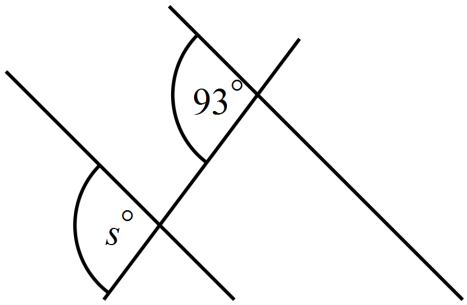
Find the size of $\angle PEF$.

$\angle PEF =$ ☐



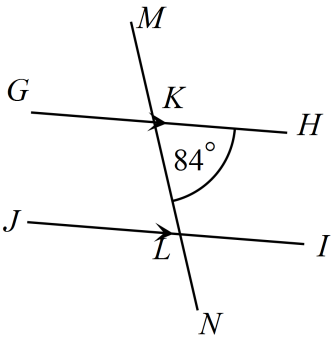
6. s = ?

- ☐ 87
- ☐ 93
- ☐ 97
- ☐ 103



7. Find the size of $\angle KLJ$.

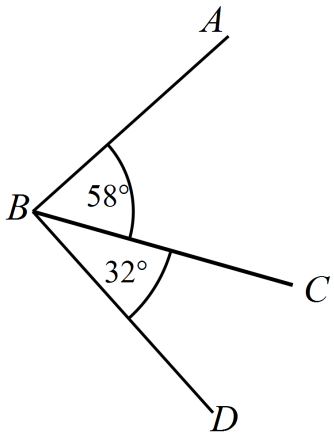
$\angle KLJ =$ ☐



8. What is the complement of 32°?

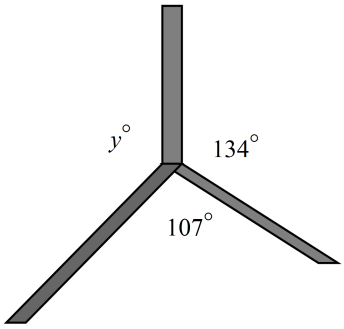
☐ o

9. Which is an accurate description of the diagram?



- ☐ $\angle ABC$ and $\angle CBD$ are adjacent, complementary angles.
- ☐ $\angle ABC$ and $\angle CBD$ are adjacent, equal angles.
- ☐ $\angle ABC$ and $\angle CBD$ are adjacent, supplementary angles.
- ☐ $\angle ABC$ and $\angle CBD$ are alternate, complementary angles.

10. Three steel beams meet at a point in a building as shown.



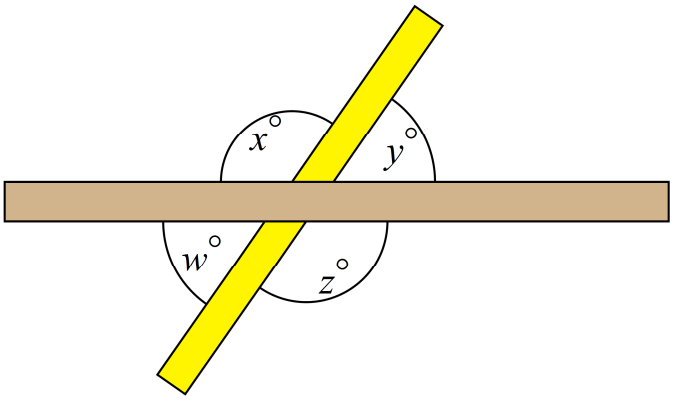
What is the value of y?

$y =$ ☐ o

11. Two straight rulers are lying crossed on a table.

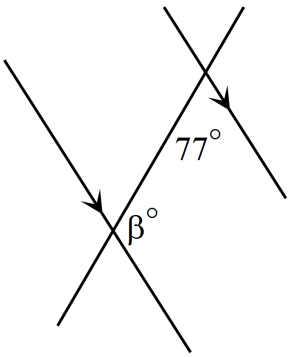
Four angles are shown.

Which statement is **not** true?



- ☐ $x = y$.
- ☐ $x = z$.
- ☐ $w = y$.
- ☐ $w + z = 180$.

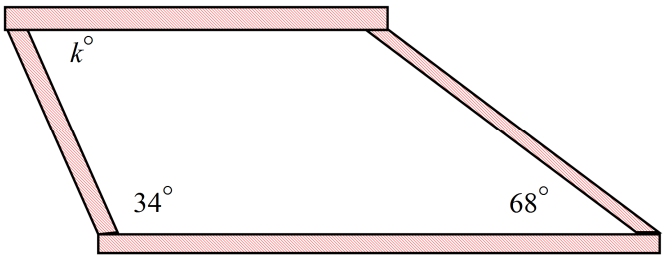
12. What is the value of β ?



$\beta =$ ☐

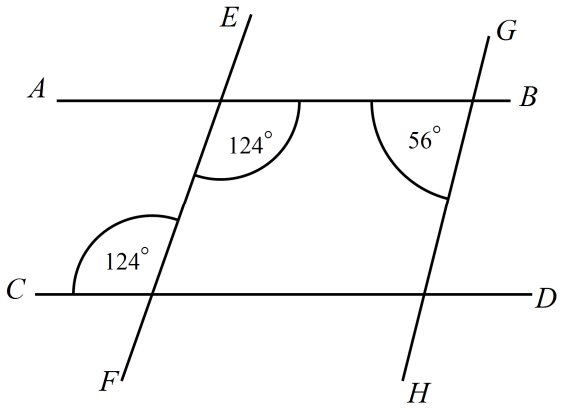
13. The diagram shows four connected rods.
The top and bottom rods are parallel.

What is the value of k ?



- ☐ $k = 34^\circ$
- ☐ $k = 68^\circ$
- ☐ $k = 112^\circ$
- ☐ $k = 146^\circ$

14. Which lines are parallel?

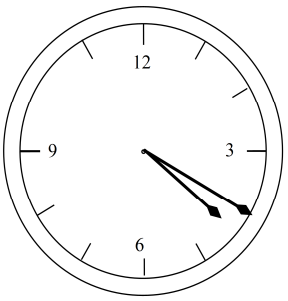


- ☐ AB || CD only.
- ☐ EF || GH only.
- ☐ AB || CD and EF || GH.
- ☐ None are parallel.

15. Which is true?

- ☐ 48° is the complement of 42° and the supplement of 132°.
- ☐ 48° is the complement of 42° and the supplement of 142°
- ☐ 48° is the complement of 132° and the supplement of 42°
- ☐ 48° is the complement of 142° and the supplement of 52°

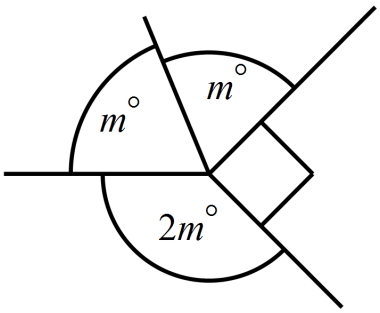
16. Through how many degrees does the hour hand of a clock move between 12:00 noon and 4:20 pm on the same day?



- ☐ 110°
- ☐ 120°
- ☐ 130°
- ☐ 140°

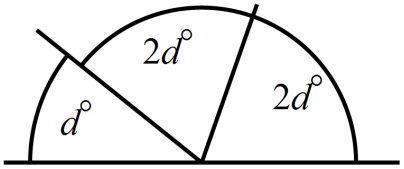
17. What is the value of m?

- ☐ $m = 67.5$
- ☐ $m = 90$
- ☐ $m = 135$
- ☐ $m = 270$



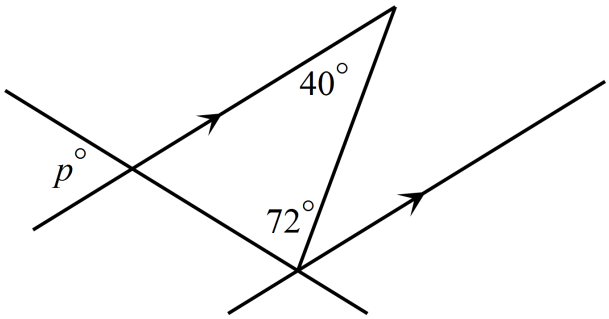
18. What is the value of d?

$d =$ ☐



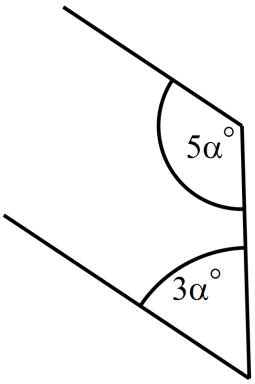
19. Find the size of p.

- ☐ $p = 40$
- ☐ $p = 68$
- ☐ $p = 72$
- ☐ $p = 112$

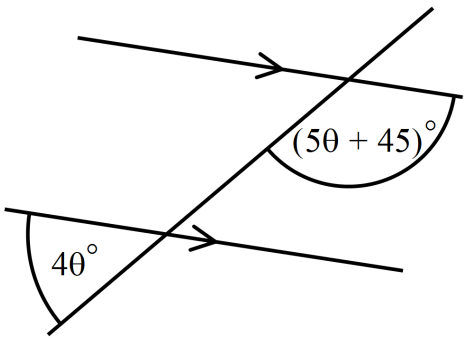


20. What is the value of α?

$\alpha =$ ☐



21. Find the value of θ.



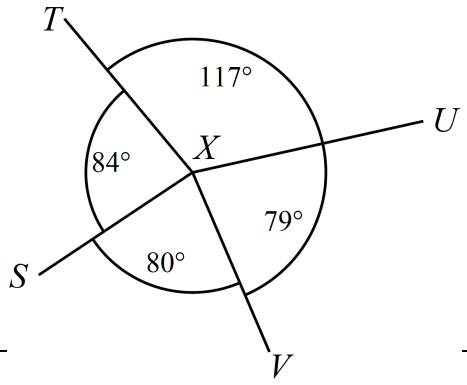
θ = ☐

High School
Mathematics Test 2014

Angle Properties
ANSWERS

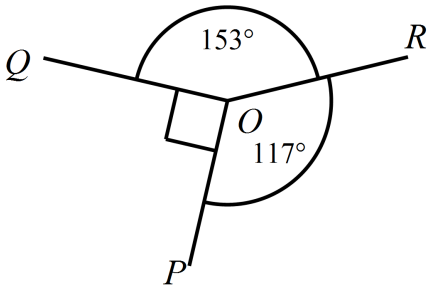
Non Calculator Section (1 mark each)

1. Four angles are marked, around a point X.
What is the size of $\angle SXT$?



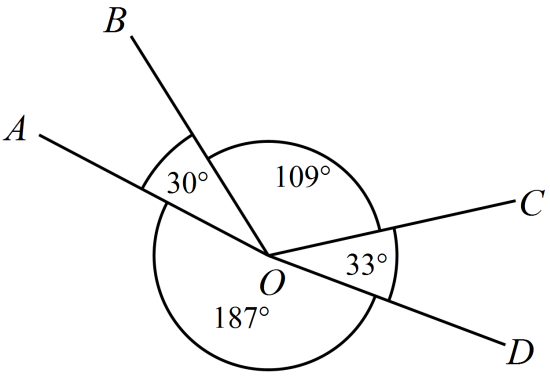
84°

2. Three angles are marked, around a point O.
What is the name of the angle which is a right angle?



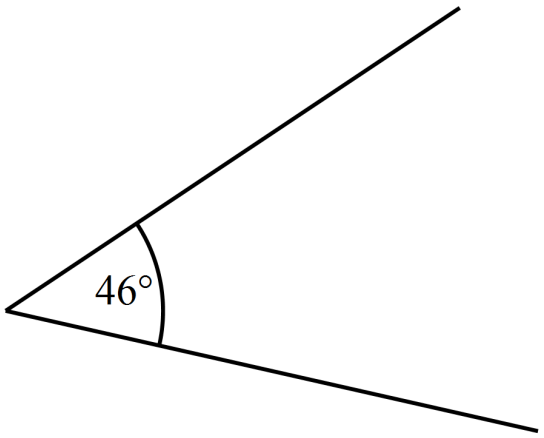
- ☐ $\angle O$
- ☒ $\angle POQ$
- ☐ $\angle ROQ$
- ☐ $\angle POR$

3. Four angles are marked, around a point O.
Which is **not** correct?



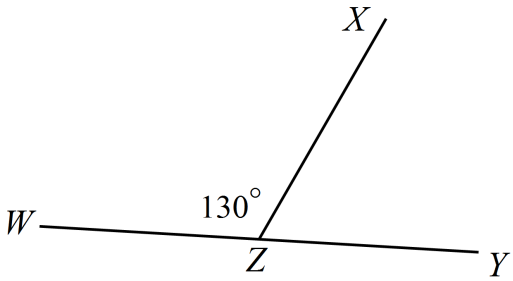
- ☐ $\angle AOB$ is an acute angle.
- ☐ $\angle BOC$ is an obtuse angle.
- ☒ $\angle AOD$ is an obtuse angle.
- ☐ $\angle COD$ is an acute angle.

4. Measure the size of $\angle HIJ$ with a protractor.

$\angle HIJ$ = 46° 

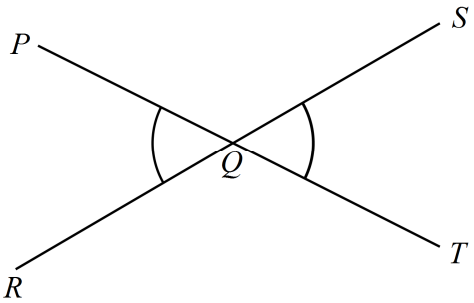
5. What is the size of $\angle XZY$?

$\angle XZY = 180 - 130 = 50$

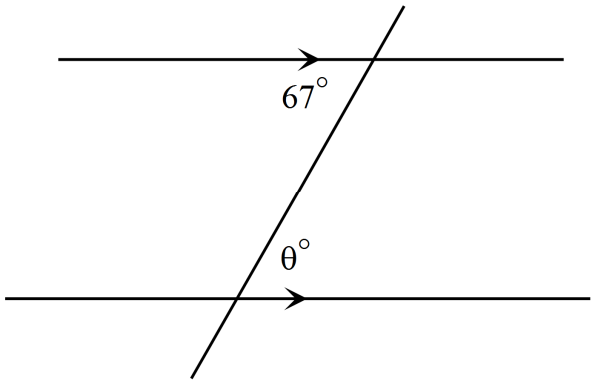
$\angle XZY$ = 50° 

6. $\angle PQR$ = ?

- ☐ $\angle PQS$.
- ☐ $\angle RQT$.
- ■ $\angle SQT$.
- ☐ $\angle SQP$.

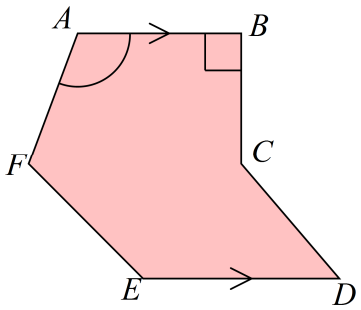


7. What is the value of θ ?

θ = 67° 

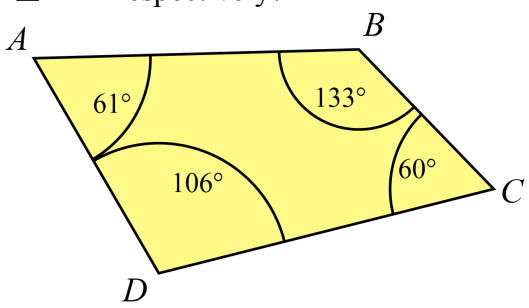
8. Which statement is true?

- ☐ $AB \,||\, ED$ and $AF \perp BC$.
- ■ $AB \,||\, ED$ and $AB \perp BC$.
- ☐ $FE \,||\, CD$ and $AB \perp BC$.
- ☐ $AB \,||\, BC$ and $AB \perp ED$.



9. What are the sizes of the two angles $\angle ABC$ and $\angle CDA$ respectively?

- ☐ 60° and 61°.
- ☐ 60° and 106°.
- ☐ 133° and 61°.
- ■ 133° and 106°.

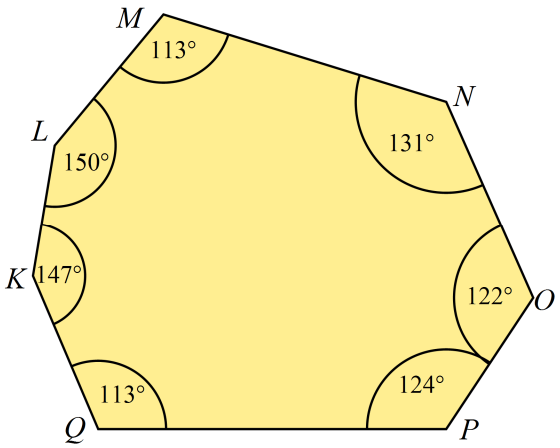


10. Name a pair of equal angles in the heptagon shown?

$\angle$ [M] and $\angle$ [Q]

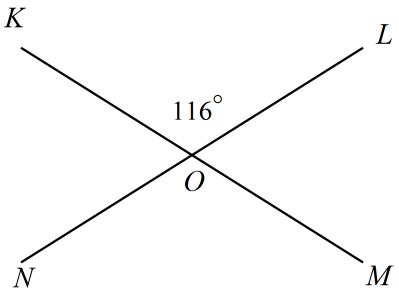
or

$\angle$ [LMN] and $\angle$ [KPQ]



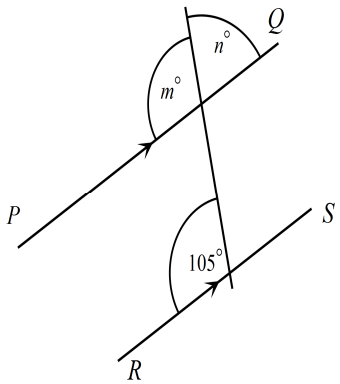
11. Regina was asked to find the size of $\angle MON$.
She correctly answered that it was 116°.
What was her reason?

- ☐ Adjacent angles are equal.
- ☐ Alternate angles are equal.
- ☐ Corresponding angles are equal.
- ■ Vertically opposite angles are equal.



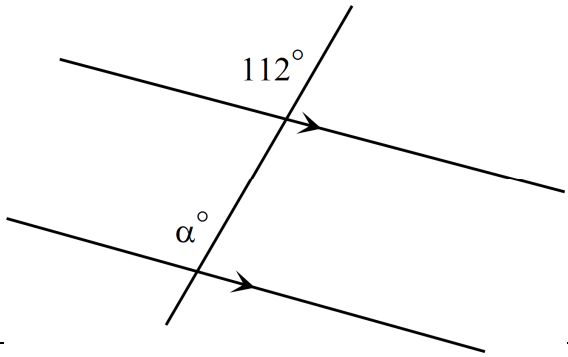
12. The lines PQ and RS are parallel.
Which is true?

- ☐ $m = 75^\circ$ and $n = 75^\circ$
- ☐ $m = 75^\circ$ and $n = 105^\circ$
- ■ $m = 105^\circ$ and $n = 75^\circ$
- ☐ $m = 105^\circ$ and $n = 105^\circ$



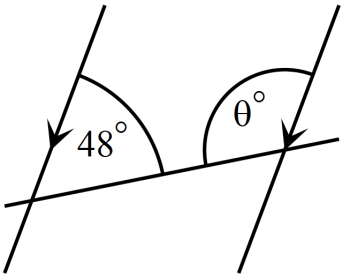
13. What is the value of α ?

α = 112



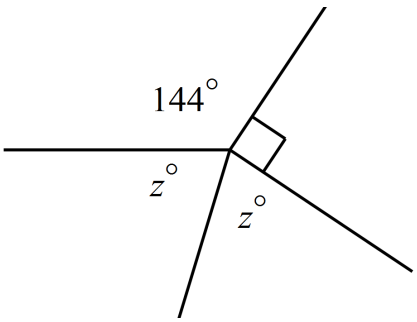
14. What is the value of θ ?

- ☐ $\theta = 42$
- ☐ $\theta = 48$
- ☐ $\theta = 52$
- ■ $\theta = 132$



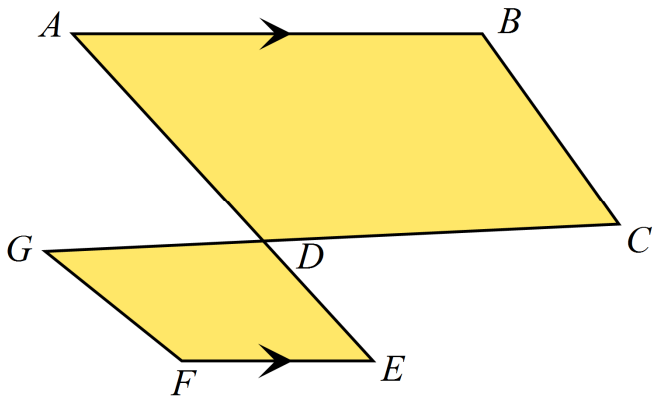
15. $z = ?$

- ■ 63
- ☐ 72
- ☐ 117
- ☐ 144



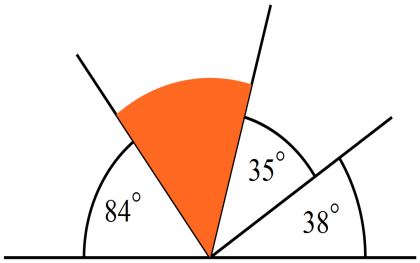
16. Name a pair of vertically opposite angles in the diagram below.

∠ ADC and ∠ GDE



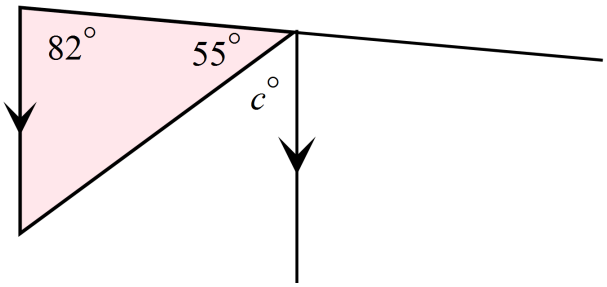
17. What is the size of the shaded angle?
180 – (84+35+38) = 180 – 157 =23

- [x] 23°
- [ ] 73°
- [ ] 119°
- [ ] 157°



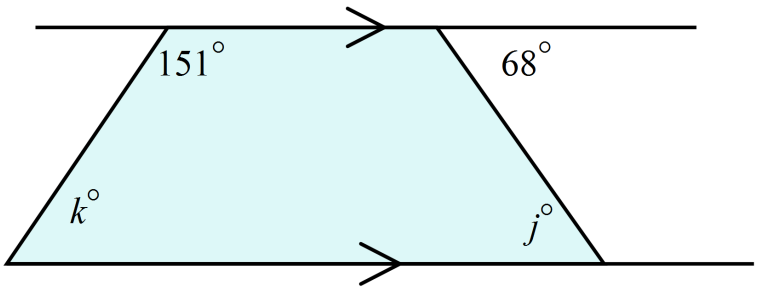
18. Find the value of c.
$c + 55 = 180 - 82$
$c = 98 - 55 = 43$

- [ ] $c = 27$
- [x] $c = 43$
- [ ] $c = 55$
- [ ] $c = 137$



19. Which is true ?

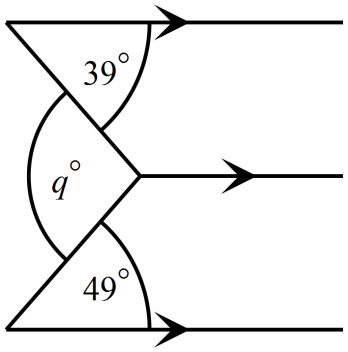
- [x] $j = 68$ and $k = 29$.
- [ ] $j = 68$ and $k = 151$.
- [ ] $j = 112$ and $k = 29$.
- [ ] $j = 112$ and $k = 151$.



20. Find the value of q.

$q = 39 + 49 = 88$

q = 88



21.

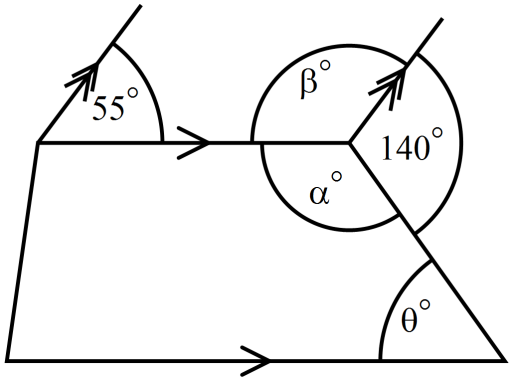
$\beta = 180 - 55 = 125$

$\alpha = 360 - (125 + 140)$

$= 360 - 265 = 95$

$\theta = 180 - 95 = 85$

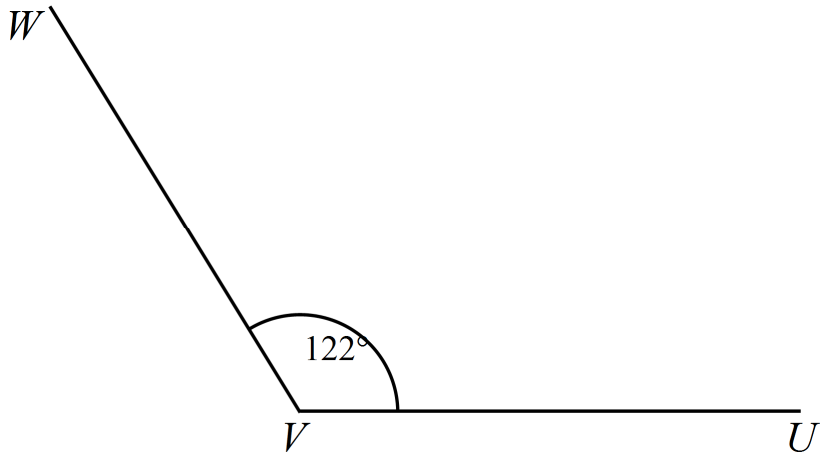
- ☐ 15°
- ■ 85°
- ☐ 95°
- ☐ 125°



High School
Mathematics Test 2014
Angle Properties
ANSWERS

Calculator Allowed Section (1 mark each)

1. Use a protractor to measure the size of $\angle UVW$.



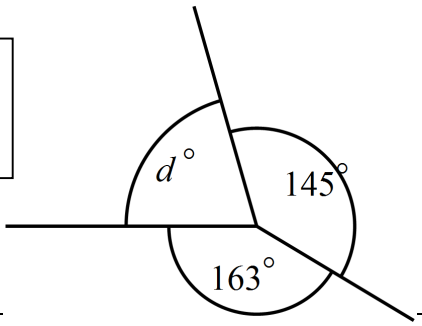
2. Complete the statement below.

Angles of 75° and 105 ° are supplementary angles.

3. Find the value of d.

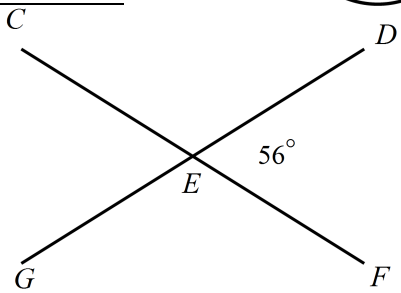
- [x] $d = 52$
- [ ] $d = 72$
- [ ] $d = 163$
- [ ] $d = 308$

$d = 360 - (145 + 163)$
$= 360 - 308$
$= 52$



4. Find the size of $\angle CED$. .

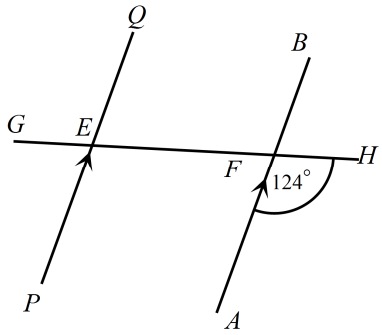
$\angle CED =$ 124



5. PQ || AB

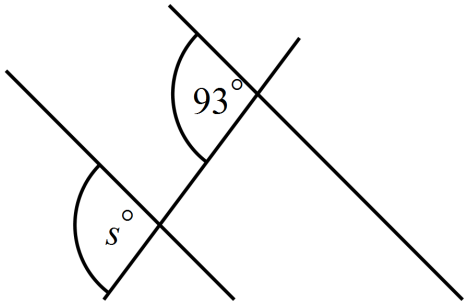
Find the size of $\angle PEF$.

$\angle PEF =$ 124°



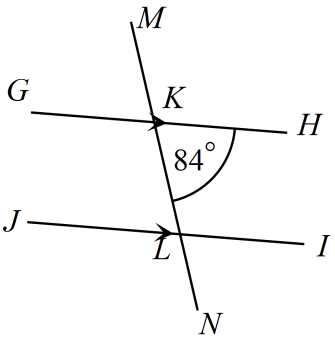
6. s = ?

- [ ] 87
- [x] 93
- [ ] 97
- [ ] 103



7. Find the size of $\angle KLJ$.

$\angle KLJ =$ 84

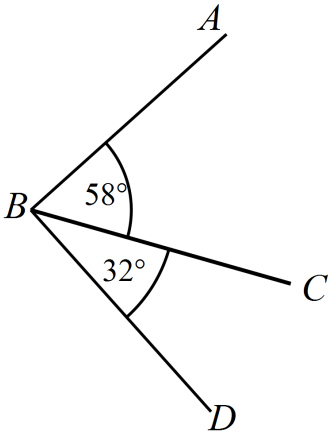


8. What is the complement of 32°?

58°

9. Which is an accurate description of the diagram?

- [x] $\angle ABC$ and $\angle CBD$ are adjacent, complementary angles.
- [ ] $\angle ABC$ and $\angle CBD$ are adjacent, equal angles.
- [ ] $\angle ABC$ and $\angle CBD$ are adjacent, supplementary angles.
- [ ] $\angle ABC$ and $\angle CBD$ are alternate, complementary angles.



10. Three steel beams meet at a point in a building as shown.

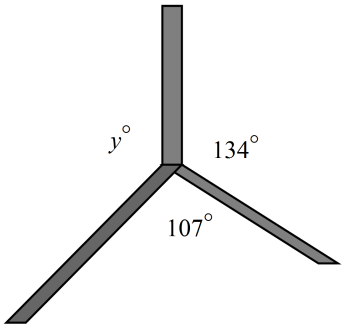
$y + 107 + 134 = 360$

$y = 360 - 241$

$= 119$

What is the value of y?

$y =$ 119 °

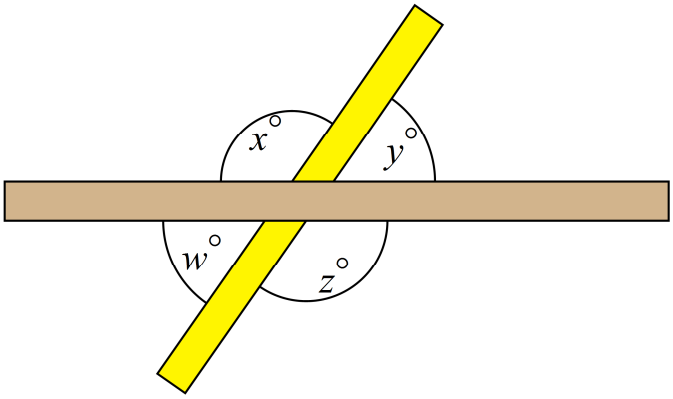


11. Two straight rulers are lying crossed on a table.

Four angles are shown.

Which statement is **not** true?

- [x] $x = y$.
- [ ] $x = z$.
- [ ] $w = y$.
- [ ] $w + z = 180$.

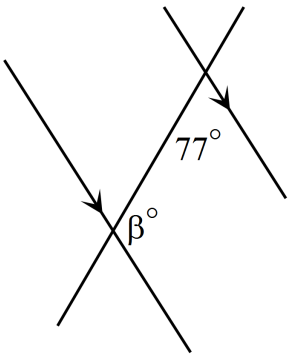


12. What is the value of β ?

$\beta = 180 - 77$

$= 103$

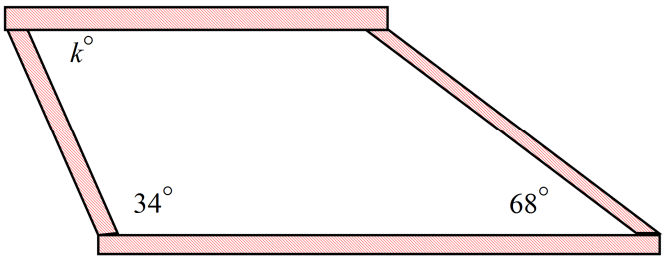
$\beta =$ 103



13. The diagram shows four connected rods.
The top and bottom rods are parallel.

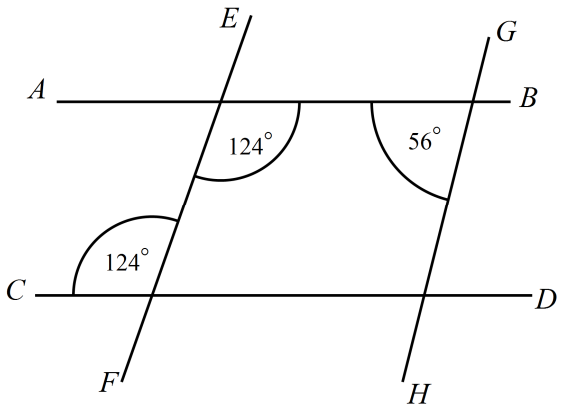
What is the value of k ?

- [ ] $k = 34°$
- [ ] $k = 68°$
- [ ] $k = 112°$
- [x] $k = 146°$



14. Which lines are parallel?

- ☐ AB || CD only.
- ☐ EF || GH only.
- ■ AB || CD and EF || GH.
- ☐ None are parallel.

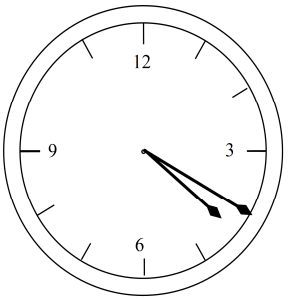


15. Which is true?

- ■ 48° is the complement of 42° and the supplement of 132°.
- ☐ 48° is the complement of 42° and the supplement of 142°
- ☐ 48° is the complement of 132° and the supplement of 42°
- ☐ 48° is the complement of 142° and the supplement of 52°

16. Through how many degrees does the hour hand of a clock move between 12:00 noon and 4:20 pm on the same day?

$4\frac{20}{60} \times \left(\frac{360}{12}\right) = 4\frac{1}{3} \times 30$



110° ☐ 120° ☐

130° ■ 140° ☐

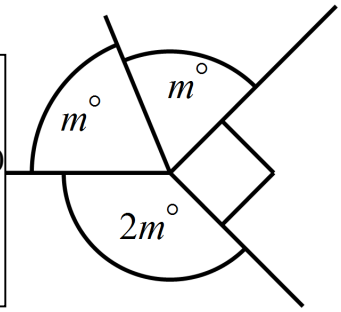
17. What is the value of m?

- ■ $m = 67.5$
- ☐ $m = 90$
- ☐ $m = 135$
- ☐ $m = 270$

$2m + m + m + 90 = 360$

$4m = 360 - 90 = 270$

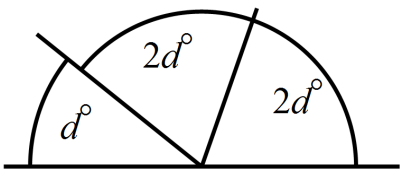
$m = \frac{270}{4} = 67.5$



18. What is the value of d?

$5d = 180 \quad d = 180 \div 5 = 36°$

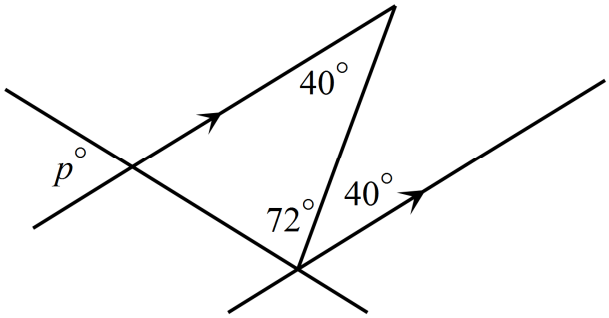
$d =$ 36°



19. Find the size of p.

- ☐ $p = 40$
- ■ $p = 68$
- ☐ $p = 72$
- ☐ $p = 112$

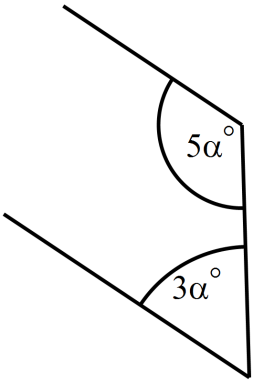
$p = 180 - (72 + 40)$
$= 180 - 112$
$= 68$



20. What is the value of α?

$\alpha =$ 22.5

$3a + 5a = 180$
$8a = 180$
$a = \frac{180}{8}$
$= 22.5$



21. Find the value of θ.

$5\theta + 45 + 4\theta = 180$
$9\theta + 45 = 180$
$9\theta = 135$
$\theta = \frac{135}{9} = 15$

$\theta =$ 15