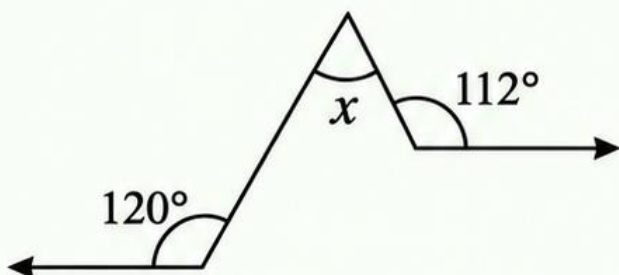


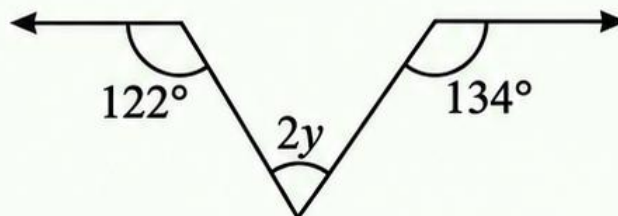
QUESTION 1

Find x .



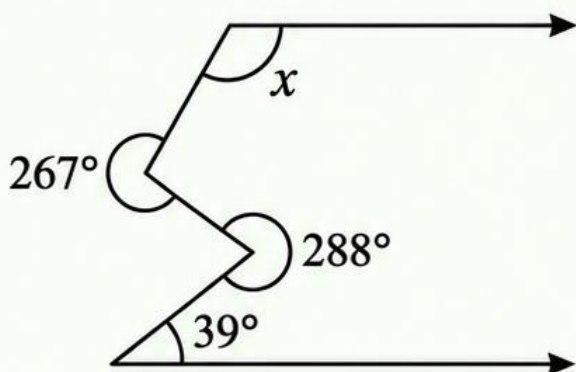
QUESTION 2

Find y .



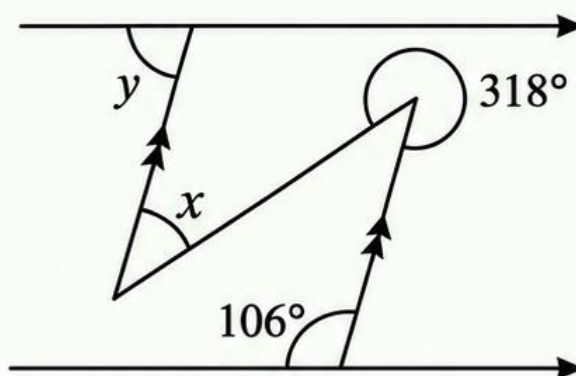
QUESTION 3

Find x .



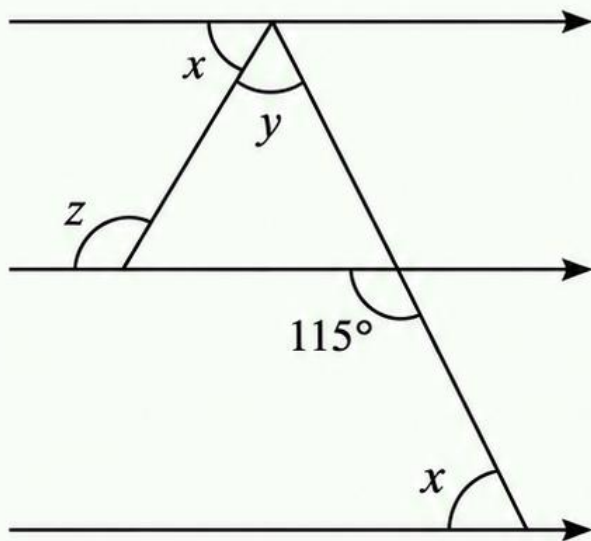
QUESTION 4

Find x and y .



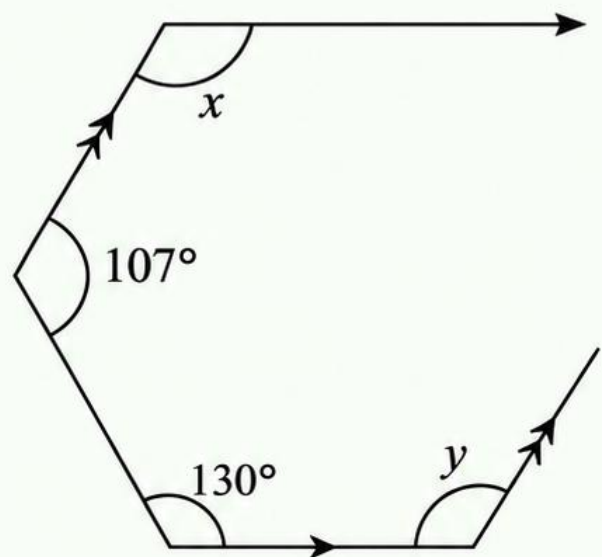
QUESTION 5

Find x , y and z .



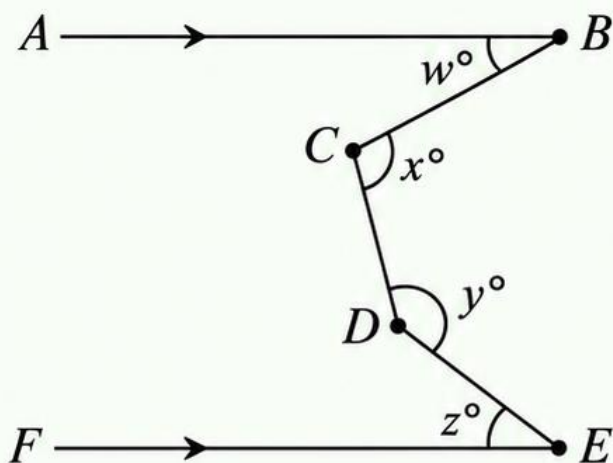
QUESTION 6

Find x and y .



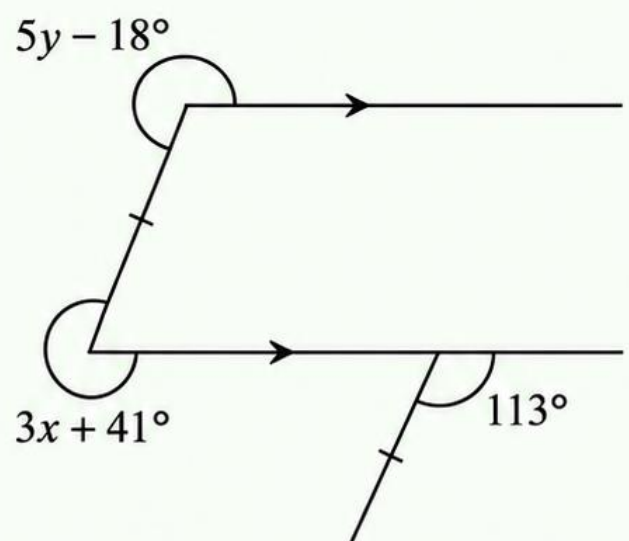
QUESTION 7

In the figure, $AB \parallel FE$, $\angle ABC = w^\circ$, $\angle BCD = x^\circ$, $\angle CDE = y^\circ$ and $\angle DEF = z^\circ$. Form an equation connecting w , x , y and z .



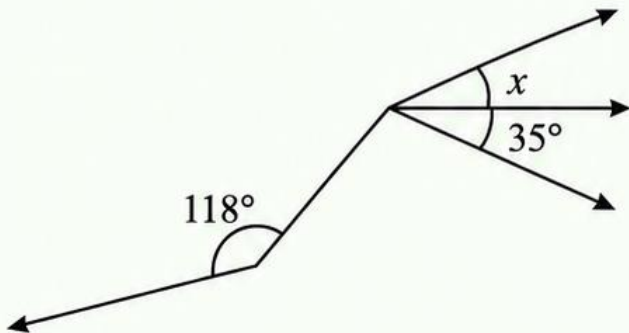
QUESTION 8

Find x and y .



QUESTION 9

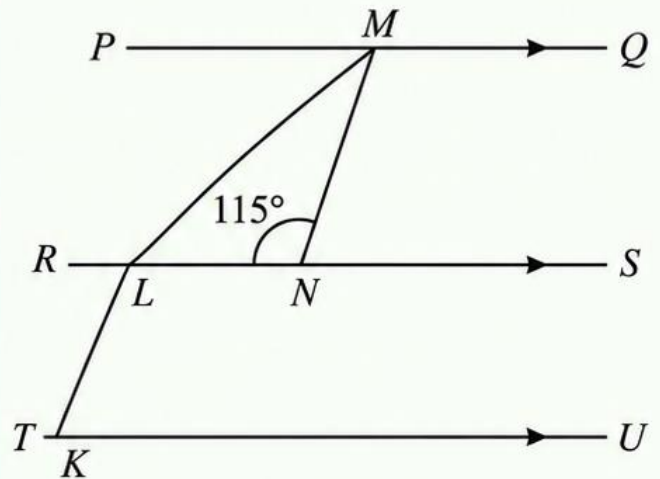
Find x .



Challenge: Is x determined?

QUESTION 10

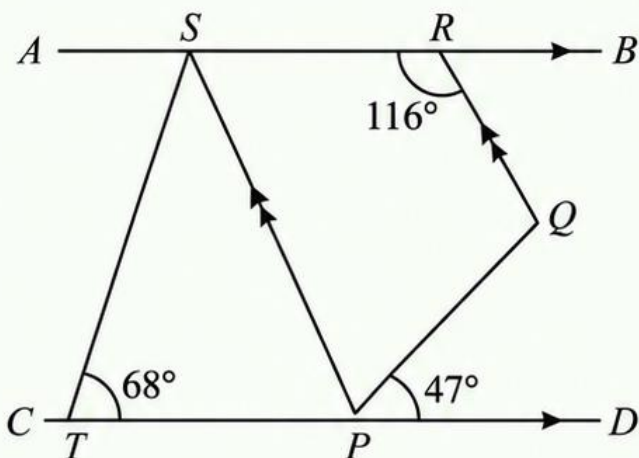
In the diagram, PQ , RS and TU are parallel. Given that $\angle LNM = 115^\circ$ and LM bisects $\angle PMN$, find $\angle LKU$.



Additional: $KL \parallel MN$

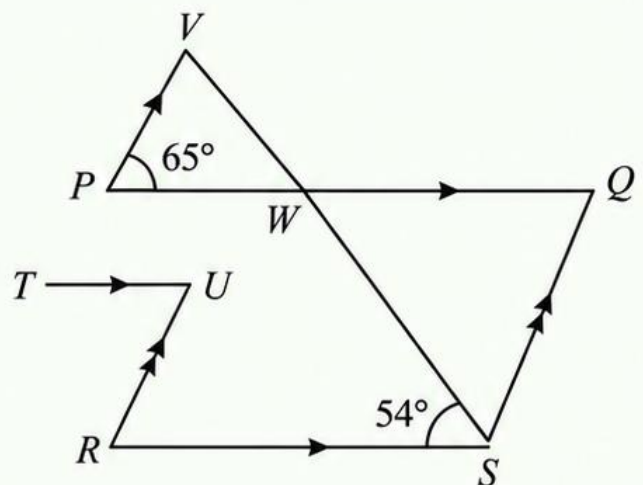
QUESTION 11

In the diagram, AB is parallel to CD and PS is parallel to QR . Given that $\angle PTS = 68^\circ$, $\angle DPQ = 47^\circ$ and $\angle QRS = 116^\circ$, find $\angle PQR$.



QUESTION 12

In the diagram, PQ , RS and TU are parallel. PV , RU and SQ are parallel. Given that $\angle VPW = 65^\circ$ and $\angle RSW = 54^\circ$, find reflex $\angle TUR$.



Basic Geometry — PDF 2 Solutions

Supplementary Practice • Questions 1–12

QUESTION 1

$x = 52^\circ$

Angles with the horizontal are $180^\circ - 120^\circ = 60^\circ$ and $180^\circ - 112^\circ = 68^\circ$. Hence $x = 180^\circ - 60^\circ - 68^\circ = 52^\circ$.

QUESTION 2

$y = 38^\circ$

The two slanted sides make angles of $180^\circ - 122^\circ = 58^\circ$ and $180^\circ - 134^\circ = 46^\circ$ with the horizontal. Thus $2y = 180^\circ - 58^\circ - 46^\circ = 76^\circ$, giving $y = 38^\circ$.

QUESTION 3

$x = 120^\circ$

The smaller angles at the reflex bends are $360^\circ - 267^\circ = 93^\circ$ and $360^\circ - 288^\circ = 72^\circ$. Tracking the directions from the lower 39° angle gives the upper rising segment at 60° to the rightward horizontal. Hence $x = 180^\circ - 60^\circ = 120^\circ$.

QUESTION 4

$x = 42^\circ; y = 74^\circ$

The angle inside the 318° reflex bend is $360^\circ - 318^\circ = 42^\circ$, equal to x because the marked sloping lines are parallel. At the horizontal transversal, $y = 180^\circ - 106^\circ = 74^\circ$.

Basic Geometry — PDF 2 Solutions

Supplementary Practice • Questions 1-12

QUESTION 5

$$x = 65^\circ; y = 50^\circ; z = 115^\circ$$

The 115° angle is supplementary to x , so $x = 65^\circ$. Corresponding angles give the other angle marked $x = 65^\circ$. At the top, $y = 180^\circ - 65^\circ - 65^\circ = 50^\circ$. Finally $z = 180^\circ - 65^\circ = 115^\circ$.

QUESTION 6

$$x = 123^\circ; y = 123^\circ$$

At the lower left bend the sloping segment makes $180^\circ - 130^\circ = 50^\circ$ with the horizontal. The upper marked parallel sloping segment therefore makes $107^\circ - 50^\circ = 57^\circ$ with the rightward horizontal. Thus $x = y = 180^\circ - 57^\circ = 123^\circ$.

QUESTION 7

$$x + y = 180^\circ + w + z$$

Draw auxiliary lines through C and D parallel to AB and FE. Tracking the turning angles along B-C-D-E shows the two inner angles together exceed a straight angle by the end angles w and z . Thus $x + y - w - z = 180^\circ$.

QUESTION 8

$$x = 84; y = 53$$

From the given 113° angle, the acute angle between the sloping and horizontal lines is 67° . The lower-left reflex angle is $360^\circ - 67^\circ = 293^\circ$, so $3x + 41 = 293$ and $x = 84$. The upper reflex angle is $360^\circ - 113^\circ = 247^\circ$, so $5y - 18 = 247$ and $y = 53$.

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Supplementary Practice • Questions 1–12

QUESTION 9

Cannot determine x uniquely from the printed data.

The diagram gives 118° at the left bend and 35° at the right vertex, but it does not mark the necessary parallel or collinear relationship between the other rays. Different configurations can preserve both givens while changing x .

Intentional challenge: x cannot be determined uniquely.

QUESTION 10

With $KL \parallel MN$: $\angle LKU = 65^\circ$

Since $PQ \parallel RS$, $\angle PMN = 180^\circ - 115^\circ = 65^\circ$.

Since $KL \parallel MN$ and $TU \parallel PQ$, $\angle LKU = 65^\circ$

(corresponding angles). The bisector fact is not needed.

QUESTION 11

$\angle PQR = 111^\circ$

Since $AB \parallel CD$, the horizontal reference direction is the same at R and P. $\angle QRS = 116^\circ$ means QR makes 64° with the rightward horizontal. PQ makes 47° with it on the other side. Therefore $\angle PQR = 64^\circ + 47^\circ = 111^\circ$.

QUESTION 12

Reflex $\angle TUR = 295^\circ$

$PQ \parallel TU$ and $PV \parallel RU$. Thus the smaller angle between UT (leftward) and UR (down-left) equals $\angle VPW = 65^\circ$. Hence reflex $\angle TUR = 360^\circ - 65^\circ = 295^\circ$. The separate 54° fact is not needed for this particular angle.

Teacher note: Q9 is intentional - students should explain why the information given cannot determine x . Q10 now includes $KL \parallel MN$.