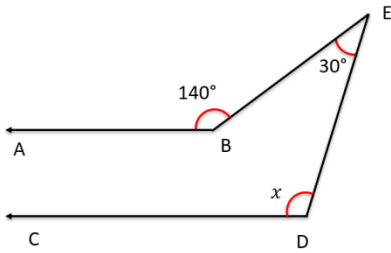


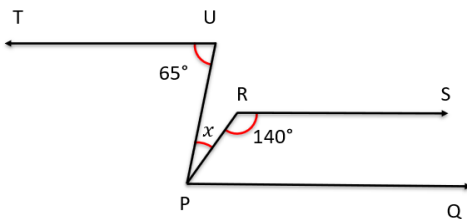


QA Lines Parallel to the Same Line

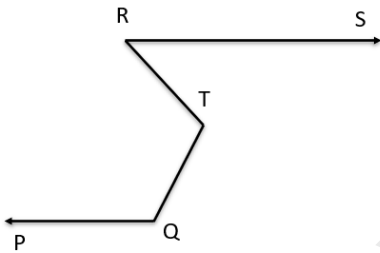
Q1. In the following figure, $AB \parallel CD$. $\angle ABE = 140^\circ$, $\angle BED = 30^\circ$ and $\angle CDE = x$. Find x .



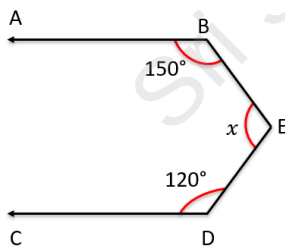
Q2. In the following figure, $PQ \parallel RS \parallel TU$. $\angle PRS = 140^\circ$, $\angle TUP = 65^\circ$ and $\angle UPR = x$. Find x .



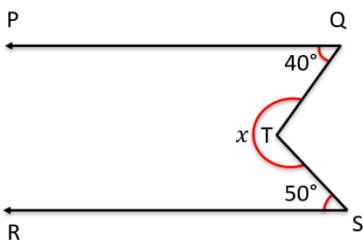
Q3. In the following figure, $PQ \parallel RS$. Prove that $\angle PQT + \angle QTR = 180^\circ + \angle TRS$.



Q4. In the following figure, $AB \parallel CD$. $\angle ABE = 150^\circ$, $\angle CDE = 120^\circ$ and $\angle BED = x$. Find x .



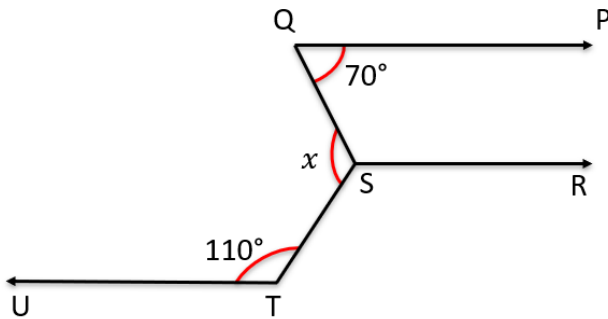
Q5. In the following figure, $PQ \parallel RS$. $\angle PQT = 40^\circ$, $\angle RST = 50^\circ$ and reflex $\angle QTS = x$. Find x .





QA Lines Parallel to the Same Line

Q6. In the following figure, $PQ \parallel RS \parallel TU$. $\angle PQS = 70^\circ$, $\angle STU = 110^\circ$ and $\angle QST = x$. Find x .



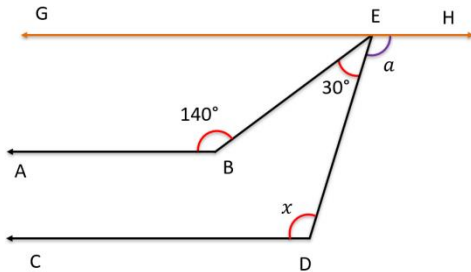
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QA Lines Parallel to the Same Line

Answer Key

A1. Through E, draw $GH \parallel AB$



Now $GH \parallel AB$ and $AB \parallel CD$. So, $GH \parallel CD$

Let $\angle DEH = a$.

$AB \parallel GH$ and BE is a transversal.

$\therefore \angle HEB = \angle ABE$ (Alternate interior angles are equal)

$$30^\circ + a = 140^\circ$$

$$a = 110^\circ$$

$GH \parallel CD$ and DE is a transversal.

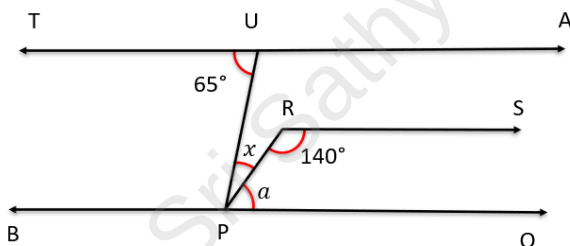
$\therefore \angle CDE = \angle DEH$ (Alternate interior angles are equal)

$$x = a$$

$$x = 110^\circ$$

Answer: $x = 110^\circ$

A2. Extend TU to TA and QP to QB . Let $\angle RPQ = a$.



$PQ \parallel RS$ and RP is a transversal.

$\therefore \angle SRP + \angle QPR = 180^\circ$ (Interior angles on the same side of the transversal are supplementary)

$$140^\circ + a = 180^\circ$$

$$a = 40^\circ$$

Now, $PQ \parallel TU$ and UP is a transversal.

$\therefore \angle QPU = \angle TUP$ (Alternate interior angles are equal)

$$x + a = 65^\circ$$

$$x + 40^\circ = 65^\circ$$

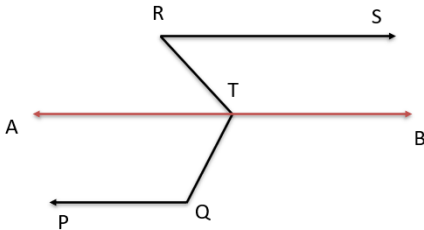
$$x = 25^\circ$$

Answer: $x = 25^\circ$



QA Lines Parallel to the Same Line

A3. Through T, draw $AB \parallel PQ$.



From the figure, $\angle QTR = \angle QTA + \angle ATR$(1)

$AB \parallel PQ$ and $PQ \parallel RS$.

So, $AB \parallel RS$.

RT is a transversal.

$\therefore \angle ATR = \angle TRS$ (Alternate interior angles are equal).....(2)

$AB \parallel PQ$ and QT is a transversal.

$\angle PQT + \angle QTA = 180^\circ$ (Interior angles on the same side of the transversal are supplementary)

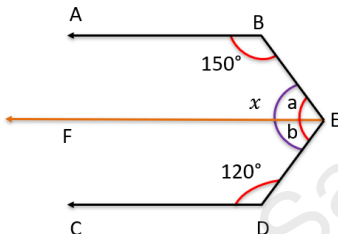
$\angle PQT + \angle QTA + \angle ATR = 180^\circ + \angle ATR$ (Adding the same quantity to LHS and RHS)

$\angle PQT + \angle QTR = 180^\circ + \angle ATR$ from (1)

$\angle PQT + \angle QTR = 180^\circ + \angle TRS$ from (2)

Hence proved.

A4. Through E draw $EF \parallel AB$. Let $\angle BEF = a$ and $\angle DEF = b$.



From the figure,

$x = a + b$(1)

$EF \parallel AB$ and $AB \parallel CD$.

$\therefore EF \parallel CD$. ED is a transversal.

$\angle CDE + \angle DEF = 180^\circ$ (Interior angles on the same side of the transversal are supplementary)

$$130^\circ + b = 180^\circ$$

$$b = 50^\circ$$

$EF \parallel AB$ and BE is a transversal.

$\angle ABE + \angle BEF = 180^\circ$ (Interior angles on the same side of the transversal are supplementary)

$$150^\circ + a = 180^\circ$$

$$a = 30^\circ$$

$$x = a + b \text{ from (1)}$$

$$x = 30^\circ + 50^\circ$$

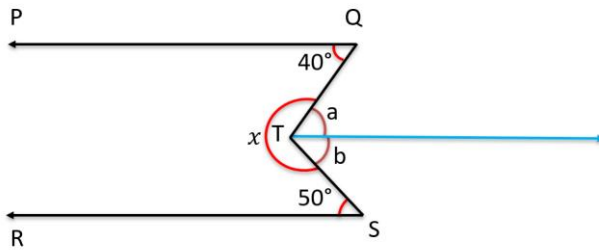
Answer: $x = 80^\circ$



QA Lines Parallel to the Same Line



A5. Through T, draw $TU \parallel PQ$. Let $\angle QTU = a$ and $\angle STU = b$.



From the figure,

$$\angle QTS = a + b \dots \dots \dots (1)$$

$TU \parallel PQ$ and $PQ \parallel RS$.

$\therefore TU \parallel RS$. ST is a transversal.

$\angle STU = \angle RST$ (Alternate interior angles are equal)

$$b = 50^\circ$$

$TU \parallel PQ$ and QT is a transversal.

$\angle QTU = \angle PQT$ (Alternate interior angles are equal)

$$a = 40^\circ$$

$$\angle QTS = a + b \dots \dots \dots \text{from (1)}$$

$$= 40^\circ + 50^\circ$$

$$\angle QTS = 90^\circ$$

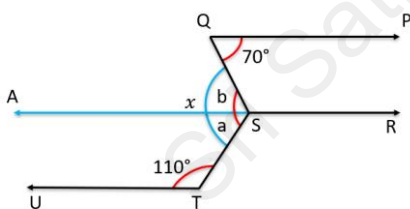
$$x = \text{reflex } \angle QTS$$

$$x = 360^\circ - 90^\circ$$

$$= 270^\circ$$

Answer: $x = 270^\circ$

A6. Extend RS to RA . Let $\angle AST = a$ and $\angle ASQ = b$.



Extend RS to RA . Let $\angle AST = a$ and $\angle ASQ = b$.

From the figure,

$$x = a + b \dots \dots \dots (1)$$

$RS \parallel TU$. ST is a transversal.

$\angle AST + \angle STU = 180^\circ$ (Interior angles on the same side of the transversal are supplementary)

$$a + 110^\circ = 180^\circ$$

$$a = 70^\circ$$

$RS \parallel PQ$ and QS is a transversal.

$\angle ASQ = \angle PQS$ (Alternate interior angles are equal)

$$b = 70^\circ$$

$$x = a + b \dots \dots \dots \text{from (1)}$$

$$x = 70^\circ + 70^\circ$$

$$x = 140^\circ$$

Answer: $x = 140^\circ$