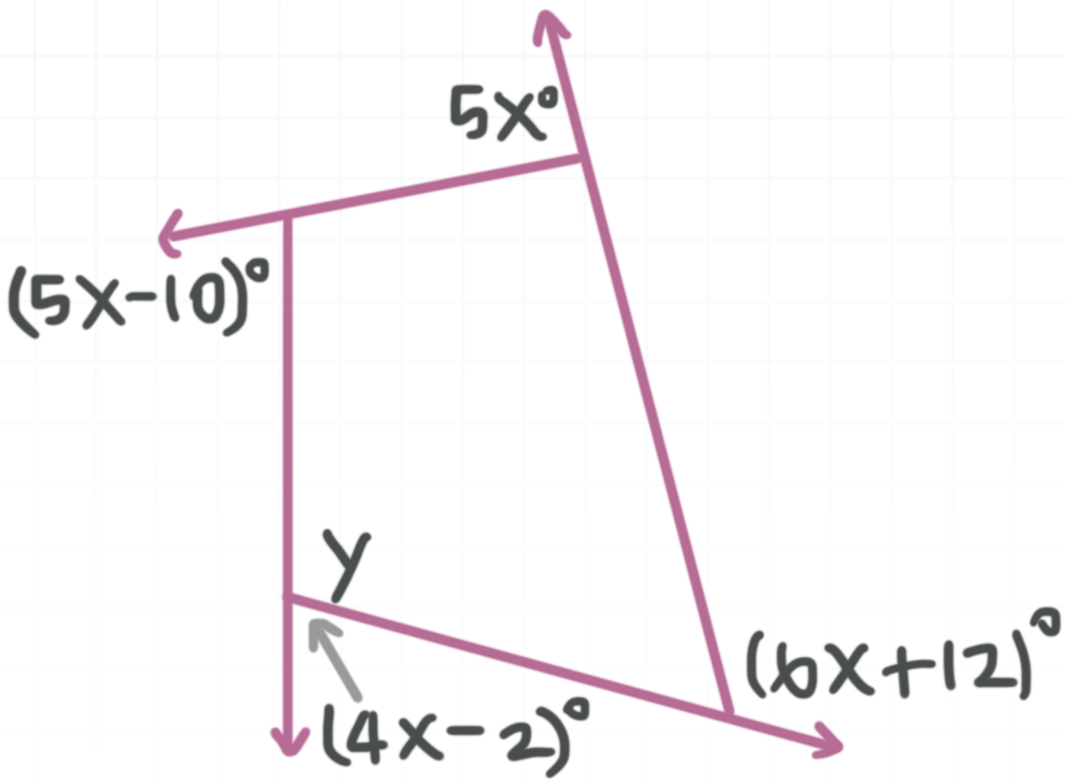
Topic: Exterior angles of polygons

Question: Find the value of y.



Answer choices:

A 105°

B 110°

C 115°

D 120°

Solution: B

The sum of the measures of the exterior angles is 360°. Therefore,

$$(4x-2)^\circ+(5x-10)^\circ+5x^\circ+(6x+12)^\circ=360^\circ$$

$$(4x^\circ+5x^\circ+5x^\circ+6x^\circ)+(-2^\circ-10^\circ+12^\circ)=360^\circ$$

$$20x^\circ+0^\circ=360^\circ$$

$$20x^\circ=360^\circ$$

$$x=18$$

The interior angle of measure y and the exterior angle of measure $(4x-2)^\circ$ are supplementary, so

$$y+(4x-2)^\circ=180^\circ$$

Substitute 18 for x and solve for y.

$$y+[4(18)-2]^\circ=180^\circ$$

$$y+(72-2)^\circ=180^\circ$$

$$y+70^\circ=180^\circ$$

$$y=110^\circ$$

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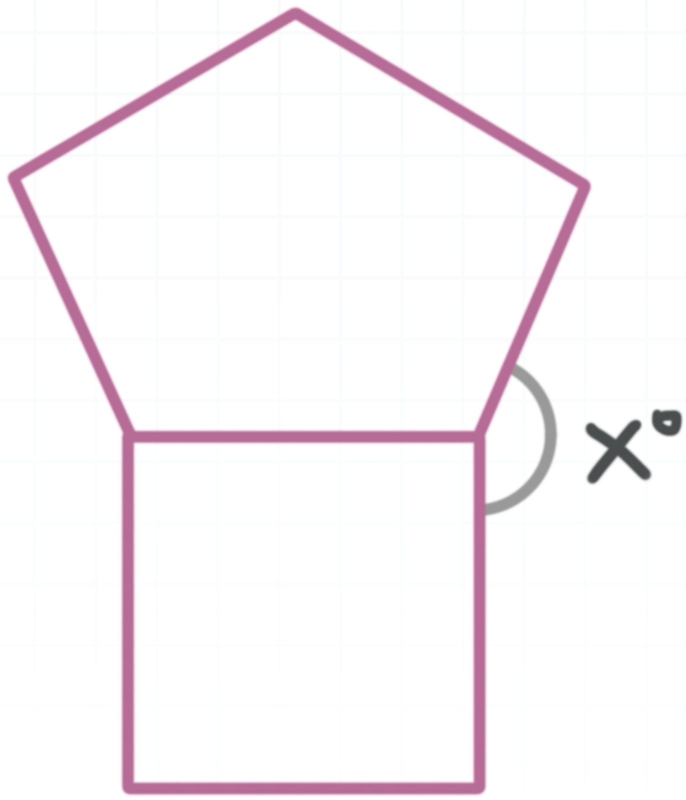
Question: The figure shows a regular pentagon and a square (a regular quadrilateral). Find the value of x.



Answer choices:

A 132°

B 142°

C 152°

D 162°

Solution: D

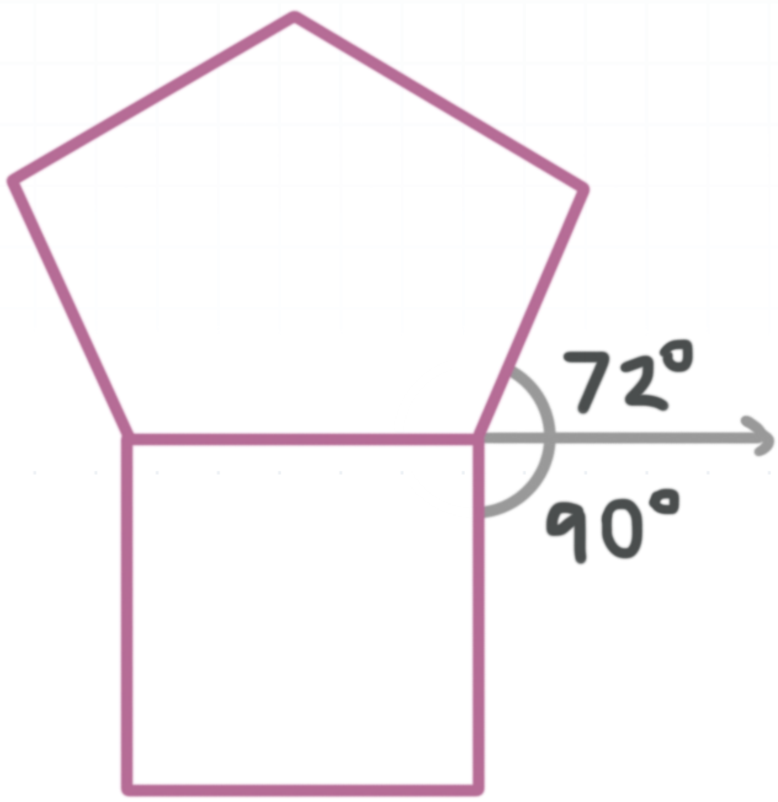
Notice that the angle of measure x is formed from an exterior angle of the pentagon and an exterior angle of the square, which are a pair of adjacent angles, and that the sum of their measures is x.

An exterior angle of a regular pentagon has a measure of

$$360^\circ \div 5 = 72^\circ$$

An exterior angle of a square has a measure of

$$360^\circ \div 4 = 90^\circ$$



Therefore,

$$x = 72^\circ + 90^\circ$$

$$x = 162^\circ$$

Topic: Exterior angles of polygons

Question: A certain regular polygon has an exterior angle of measure $2x+8^\circ$ and an exterior angle of measure $56^\circ - x$. What is the sum of the interior angles of the polygon?

Answer choices:

A $1{,}080^\circ$

B $1{,}260^\circ$

C $1{,}440^\circ$

D $1{,}620^\circ$

Solution: B

All the exterior angles of a regular polygon are congruent, so

$$2x + 8^\circ = 56^\circ - x$$

$$3x + 8^\circ = 56^\circ$$

$$3x = 48^\circ$$

$$x = 16^\circ$$

Using the exterior angle of measure $56^\circ - x$, we find that the measure of each exterior angle is

$$56^\circ - 16^\circ = 40^\circ$$

The number of sides, n, will be

$$360^\circ \div 40^\circ = 9$$

The sum of the measures of the interior angles is therefore

$$(9 - 2)180^\circ = 1{,}260^\circ$$