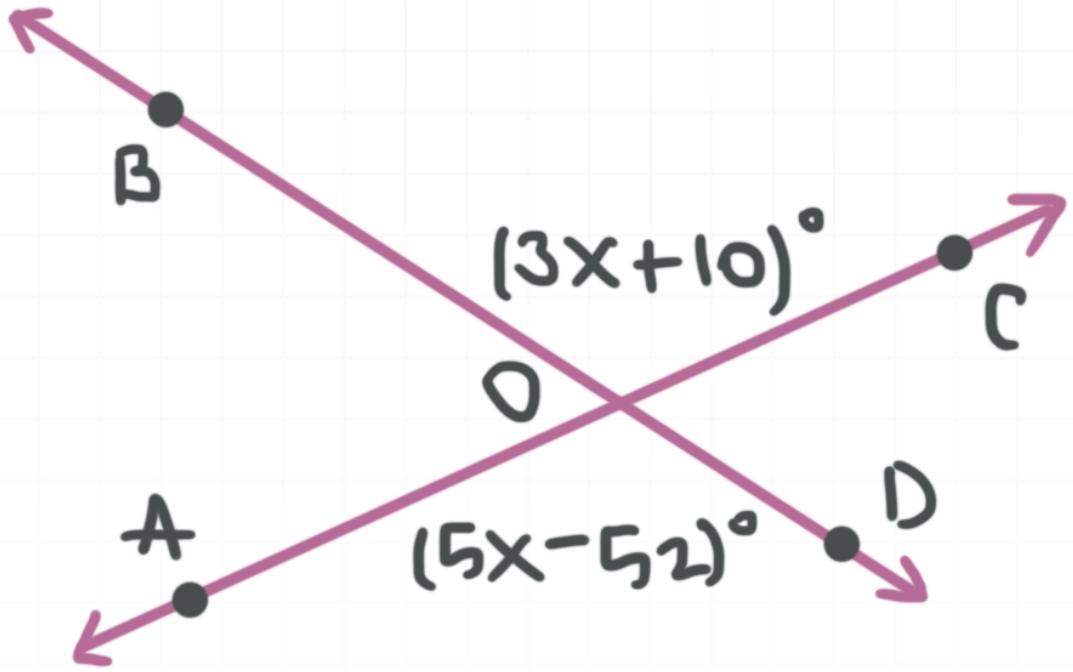
Topic: Congruent angles

Question: What is the measure of $\angle BOA$?



Answer choices:

A $31°$

B $54°$

C $77°$

D $82°$

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Solution: C

Vertical angles are congruent, so

$$5x - 52 = 3x + 10$$

$$2x = 62$$

$$x = 31$$

Therefore,

$$m\angle COB = (3x + 10)^\circ = (3(31) + 10)^\circ = 103^\circ$$

The measures of $\angle BOA$ and $\angle COB$ add up to 180°, so

$$m\angle BOA + 103^\circ = 180^\circ$$

$$m\angle BOA = 77^\circ$$

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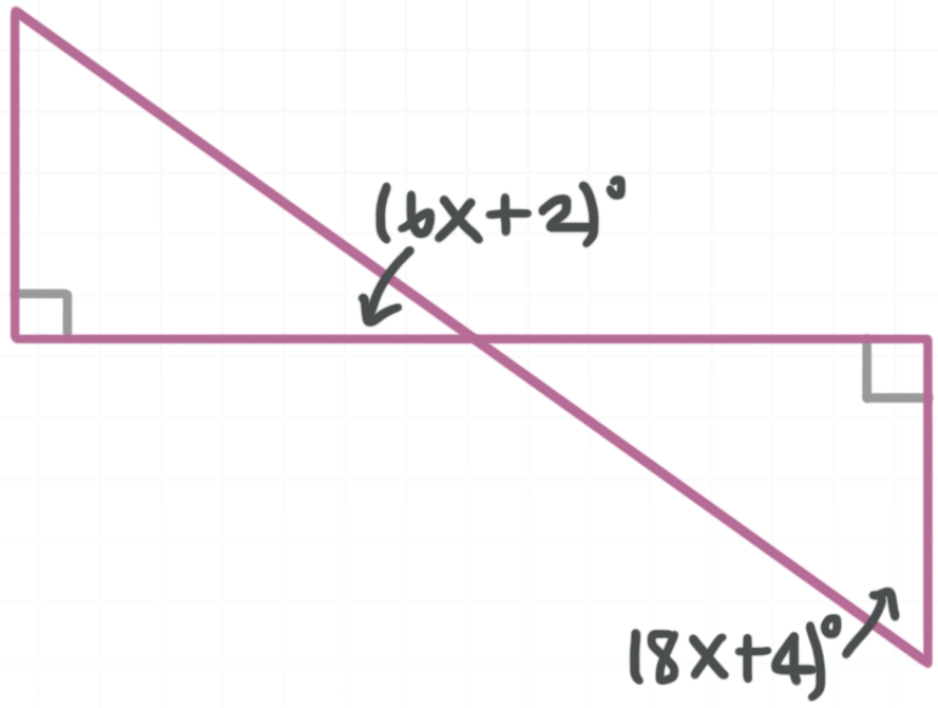
Question: Solve for x.



Answer choices:

A -1

B 6

C 11

D 14

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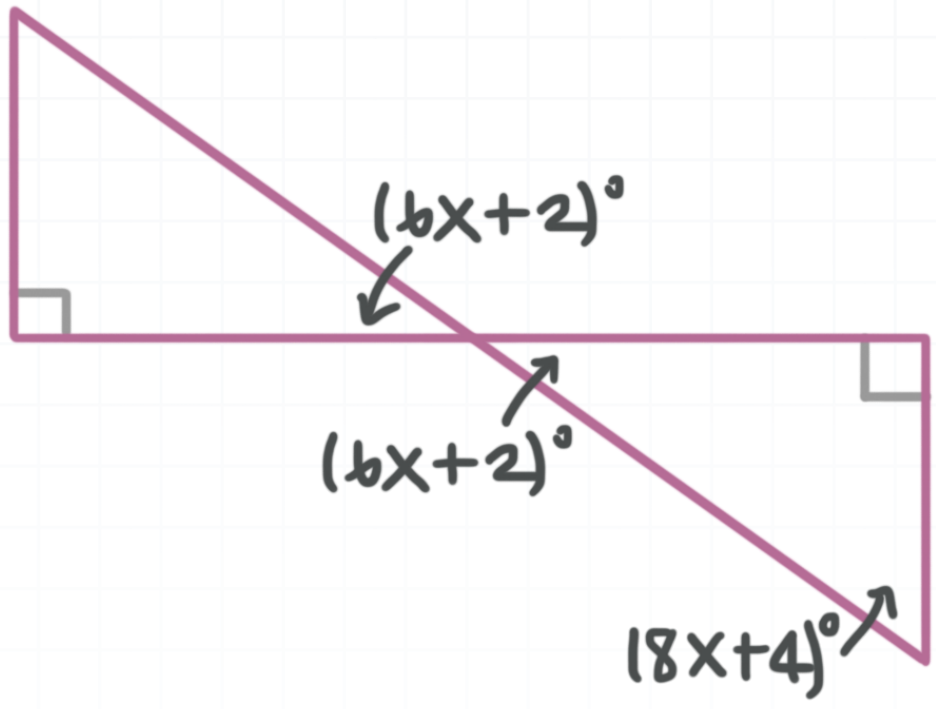
Solution: B

Vertical angles are congruent, so the angle opposite the one of measure $(6x + 2)^\circ$ also has measure $(6x + 2)^\circ$.



The sum of the measures of the interior angles of the triangle on the right must be 180°. Therefore,

$$(6x + 2) + (8x + 4) + 90 = 180$$

$$14x + 96 = 180$$

$$14x = 84$$

$$x = 6$$

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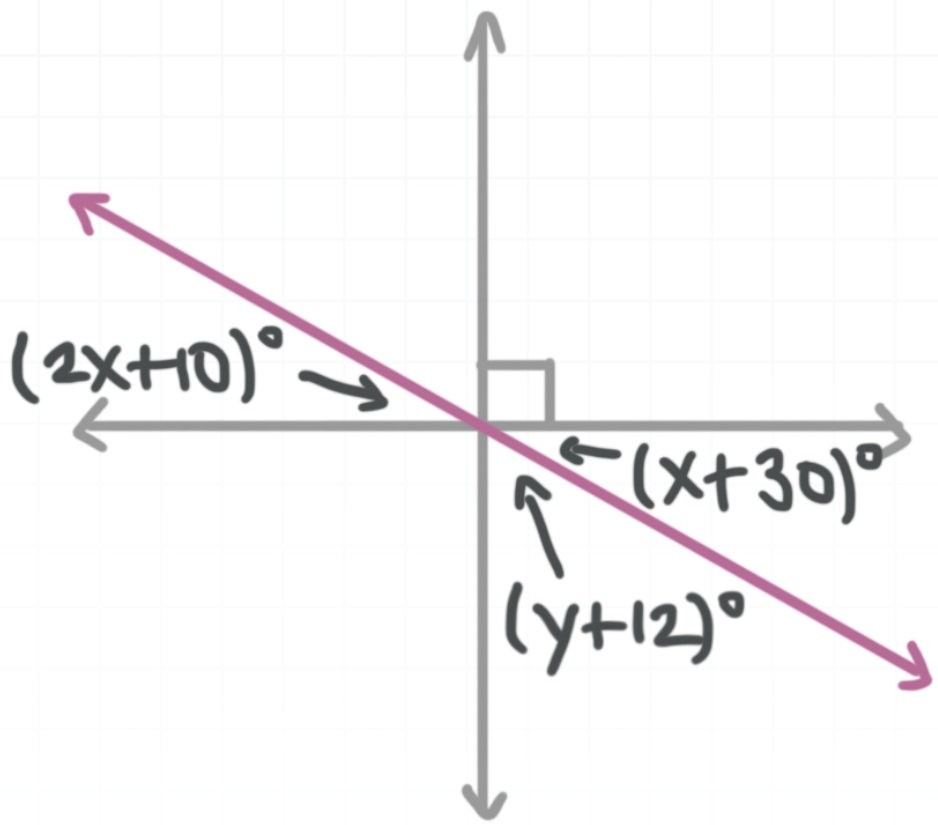
Question: Solve for y.



Answer choices:

A 20

B 28

C 38

D 40

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Solution: B

Vertical angles are congruent, so

$$2x + 10 = x + 30$$

$$x = 20$$

Taken together, the angles of measure $(x + 30)^\circ$ and $(y + 12)^\circ$ form a right angle, so

$$(x + 30) + (y + 12) = 90$$

We can now substitute 20 for x and solve for y.

$$(20 + 30) + (y + 12) = 90$$

$$62 + y = 90$$

$$y = 28$$

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