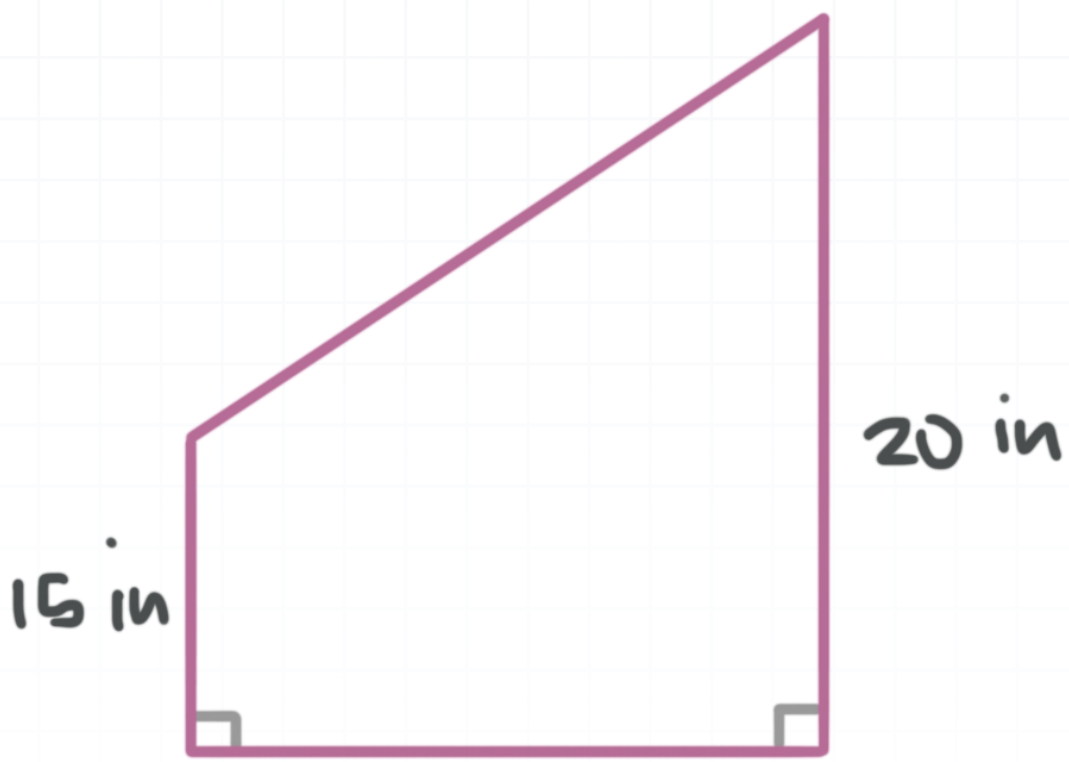
Topic: Area of a trapezoid

Question: What is the area of the trapezoid?



Answer choices:

A $315\ \text{in}^2$

B $360\ \text{in}^2$

C $424\ \text{in}^2$

D $630\ \text{in}^2$

Solution: A

Even though the two parallel sides are vertical in the figure, they're still the bases (because they are parallel). We can mentally rotate the figure by $90°$ if that helps.

So the bases are the sides of length 15 in and 20 in.

Likewise, even though the 18 in side is on the bottom, it's still considered the height. So the height is 18 in.

$$\text{area} = \frac{1}{2}(15 \text{ in} + 20 \text{ in})(18 \text{ in})$$

$$\text{area} = \frac{1}{2}(35 \text{ in})(18 \text{ in})$$

$$\text{area} = \frac{1}{2}(630 \text{ in}^2)$$

$$\text{area} = 315 \text{ in}^2$$

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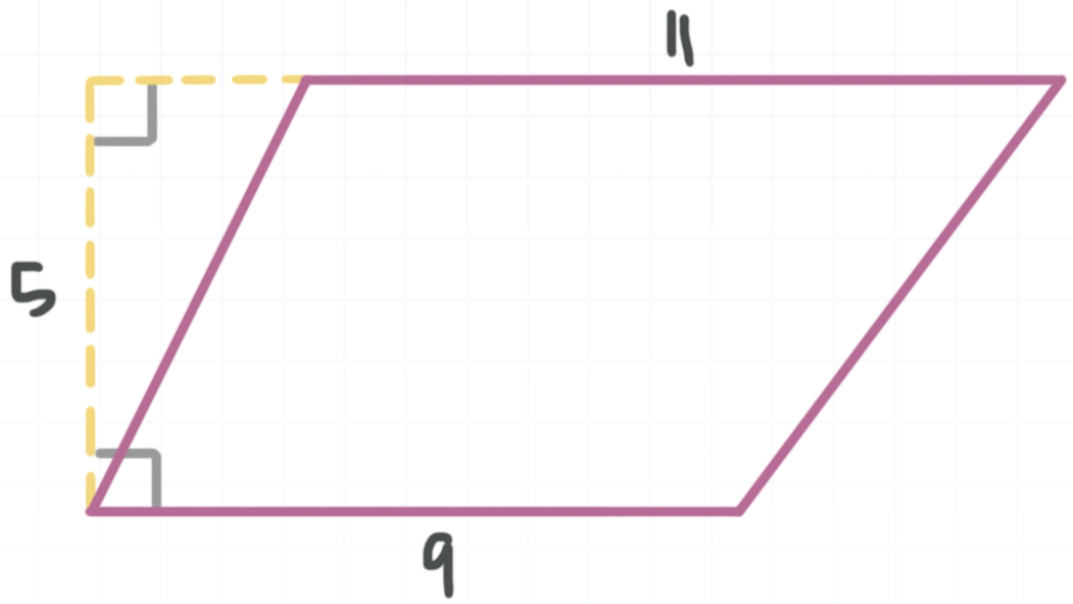

Answer choices:

A 30

B 45

C 50

D 55

Solution: C

The bases are the sides of lengths 9 and 11. The segment of length 5 is the height because it's perpendicular to the bottom base (the base of length 9) and to the (extension of the) top base (the base of length 11).

$$\text{area} = \frac{1}{2}(9 + 11)(5)$$

$$\text{area} = \frac{1}{2}(20)(5)$$

$$\text{area} = \frac{1}{2}(100)$$

$$\text{area} = 50$$

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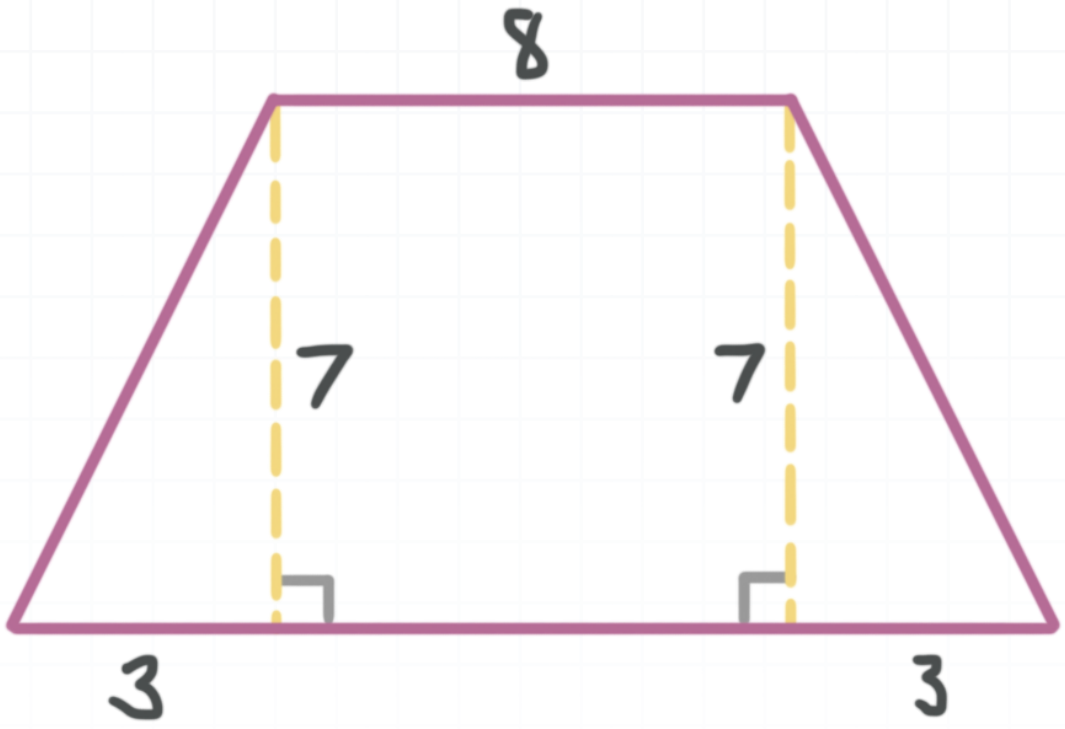


Answer choices:

A 49

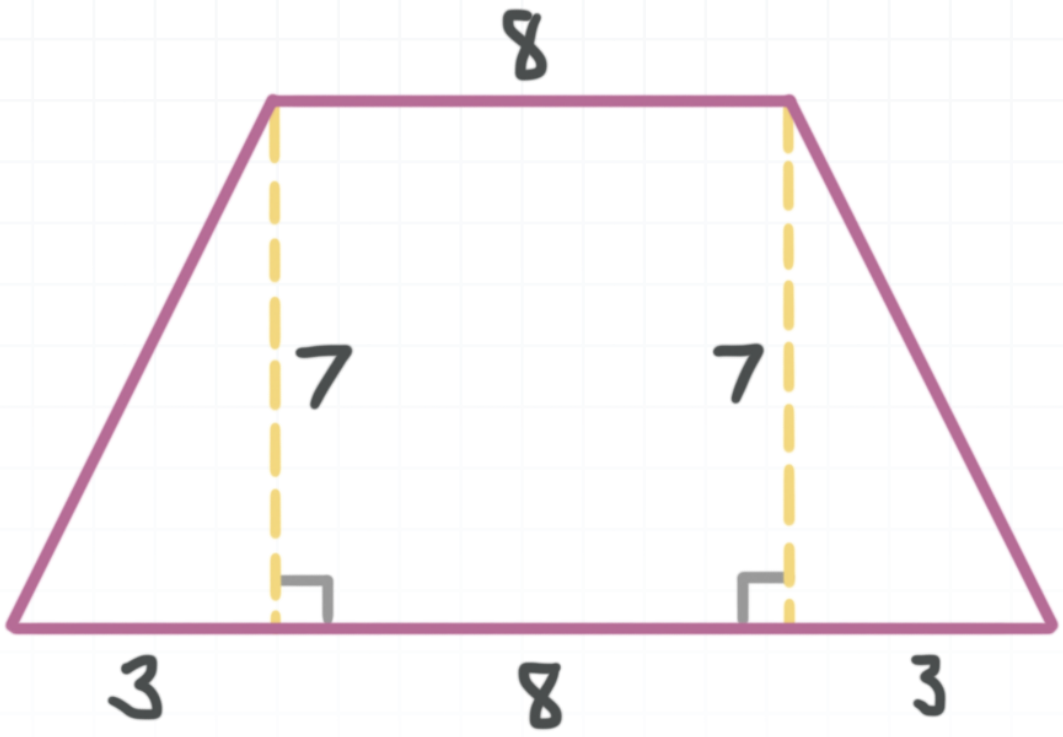
B 56

C 62

D 77

Solution: D

By drawing in the two segments of length 7 (which are both perpendicular to the bottom base of the trapezoid), we get a rectangle.



The base of the rectangle is 8.

This gives us the length of the bottom base of the parallelogram as

$$3 + 8 + 3 = 14$$

Which means the area is given by

$$\text{area} = \frac{1}{2}(8 + 14)(7)$$

$$\text{area} = \frac{1}{2}(22)(7)$$

$$\text{area} = \frac{1}{2}(154)$$

area = 77