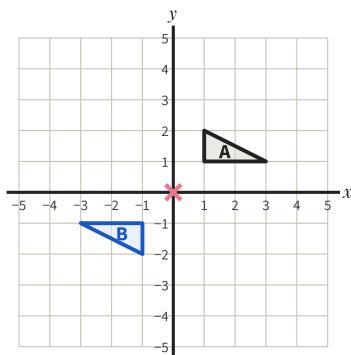


Enlargement: Negative Scale Factors

ANSWERS

1

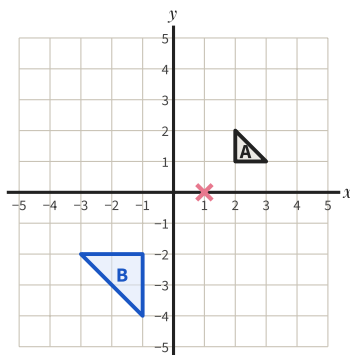
Enlarge shape A by scale factor -1 , centre $(0, 0)$. Label the image B.



Corners $(-1, -1), (-3, -1), (-1, -2)$

2

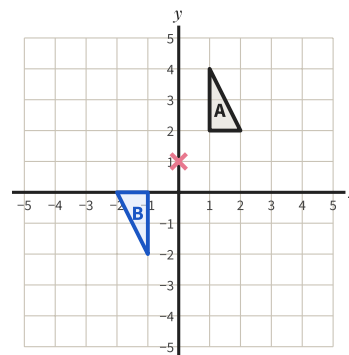
Enlarge shape A by scale factor -2 , centre $(1, 0)$. Label the image B.



Corners $(-1, -2), (-3, -2), (-1, -4)$

3

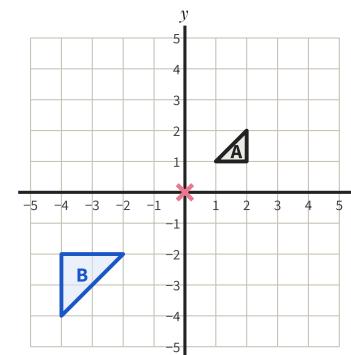
Enlarge shape A by scale factor -1 , centre $(0, 1)$. Label the image B.



Corners $(-1, 0), (-2, 0), (-1, -2)$

4

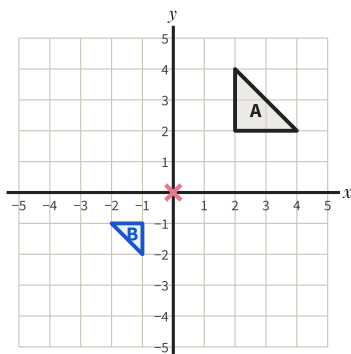
Enlarge shape A by scale factor -2 , centre $(0, 0)$. Label the image B.



Corners $(-2, -2), (-4, -2), (-2, -4)$

5

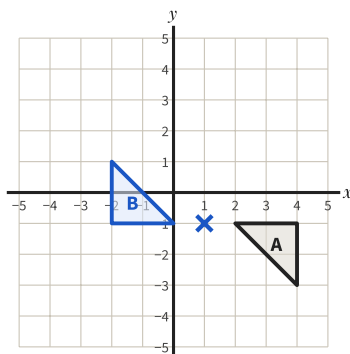
Enlarge shape A by scale factor $-\frac{1}{2}$, centre $(0, 0)$. Label the image B.



Corners $(-1, -1), (-2, -1), (-1, -2)$

6

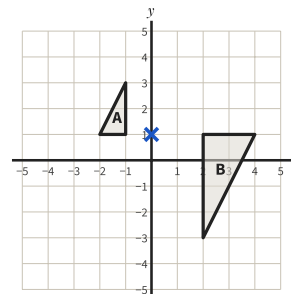
Enlarge shape A by scale factor -1 , centre $(1, -1)$. Label the image B.



Corners $(0, -1), (-2, -1), (0, -2)$

7

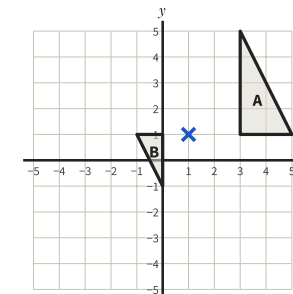
Describe fully the single transformation that maps A onto B.



Enlargement scale factor -2
centre $(0, 1)$

8

Describe fully the single transformation that maps A onto B.



Enlargement scale factor $-\frac{1}{2}$
centre $(1, 1)$

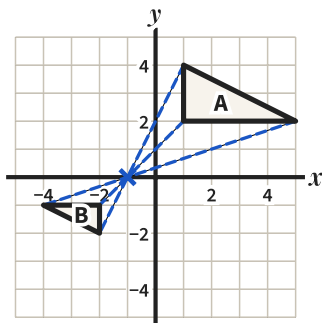
Enlargement: Negative Scale Factors *further practice*

ANSWERS

9



Describe fully the single transformation that maps shape A onto shape B.



upside down, half size: corners join through $(-1, 0)$

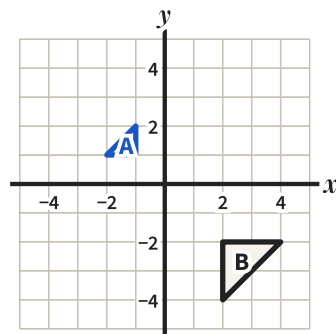
enlargement, scale factor $-\frac{1}{2}$, centre $(-1, 0)$

Answer

10



Shape B is the image of shape A after an enlargement by scale factor -2 , centre $(0, 0)$. Draw shape A.



A: $(-1, 1)$, $(-2, 1)$, $(-1, 2)$

Answer

11



In a computer game a triangle has corners at $(3, 2)$, $(4, 2)$ and $(3, 5)$. The game enlarges it by scale factor -2 , centre $(1, 1)$. Find the corners of the new triangle.

$(3, 2)$ is 2 right and 1 up from $(1, 1)$

so its image is 4 left and 2 down: $(-3, -1)$

$(-3, -1)$, $(-5, -1)$, $(-3, -7)$

Answer

12



Shape A has an area of 6 cm^2 and a perimeter of 12 cm . It is enlarged by scale factor -3 . Find the area and the perimeter of the image.

lengths $\times 3$: the minus sign only turns the shape round

area $\times 3^2 = 9$, perimeter $\times 3$

54 cm^2 , 36 cm

Answer

13



An enlargement with scale factor -2 maps the point P $(5, 3)$ to P' $(-4, -3)$. Find the centre of enlargement.

the centre splits PP' in the ratio 1:2

from P: 1 third of $(-9, -6)$ is $(-3, -2)$, so $(5-3, 3-2)$

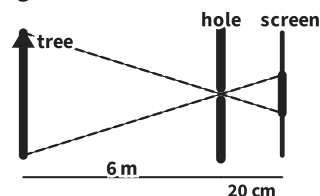
$(2, 1)$

Answer

14



A pinhole camera makes an upside down image of a tree 1.8 m tall on a screen. The image is an enlargement of the tree with centre the hole (not to scale). Find the scale factor and the height of the image.



$$-0.2 \div 6 = -\frac{1}{30} \text{ (upside down),}$$

$$1.8 \text{ m} \div 30 = 0.06 \text{ m}$$

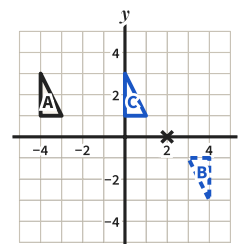
$-\frac{1}{30}$, 6 cm

Answer

15



A is enlarged by scale factor -1 , centre $(0, 0)$, to give B. B is enlarged by scale factor -1 , centre $(2, 0)$ (marked $\times$), to give C. Describe fully the single transformation that maps A onto C.



draw B, then C: every corner moves 4 right

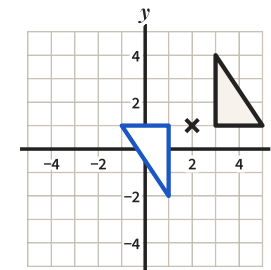
translation by $\begin{pmatrix} 4 \\ 0 \end{pmatrix}$

Answer

16



Mo says an enlargement by scale factor -1 , centre $(2, 1)$, does the same as a rotation of 180° about $(2, 1)$. Is Mo right? Explain. You can test it on the shape.



both send each point through $(2, 1)$ to the same distance beyond

Yes

Answer