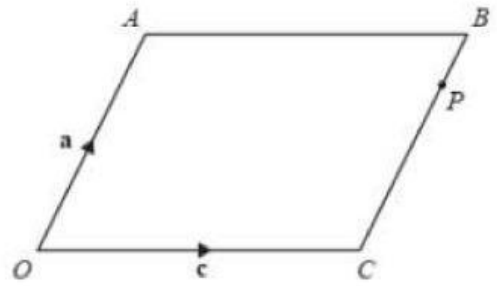
1.



$OABC$ is a parallelogram.
$\overrightarrow{OA} = a$ and $\overrightarrow{OC} = c$
P is the point on CB such that $CP : PB = 3 : 1$.
Find $\overrightarrow{OP}$ in terms of a and/or c, in it's simplest form.

A) $c + \frac{5}{4}a$
B) $2c + \frac{5}{4}a$
C) $2c + \frac{4}{3}a$
D) $c + \frac{3}{4}a$

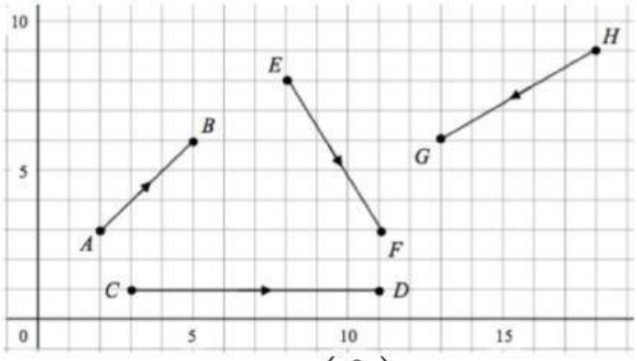
2. If A is point $(2, -4)$ and point B is $(10, 2)$. **Find** $|\overrightarrow{AB}|$

A) $\sqrt{68}$
B) 5
C) $\sqrt{148}$
D) 10

3. Given $p = \begin{pmatrix} 3 \\ 5 \end{pmatrix}$ and $r = \begin{pmatrix} -4 \\ 5 \end{pmatrix}$.
Find the vector of $p - 2r$

A) $\begin{pmatrix} -10 \\ -5 \end{pmatrix}$
B) $\begin{pmatrix} -5 \\ -5 \end{pmatrix}$
C) $\begin{pmatrix} 11 \\ -5 \end{pmatrix}$
D) $\begin{pmatrix} 7 \\ 0 \end{pmatrix}$

4. The following diagram shows some vectors in a grid.

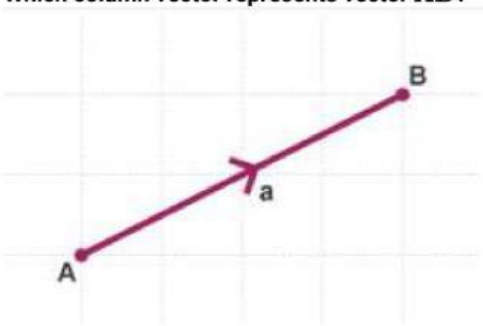


Which of the vector represents $\begin{pmatrix} 3 \\ -5 \end{pmatrix}$

A) AB
B) HG
C) EF
D) CD

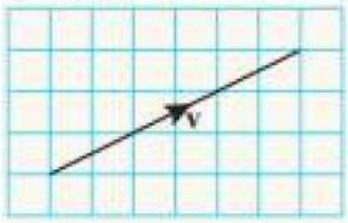
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5. **Which column vector represents vector AB?**



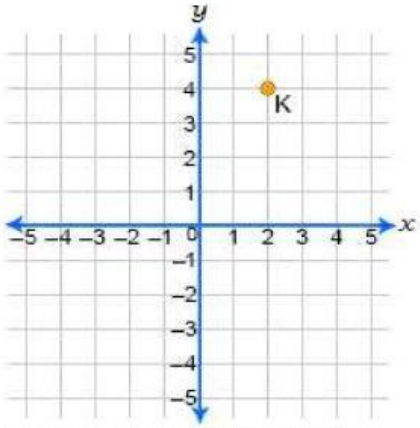
A) $\begin{pmatrix} -4 \\ -2 \end{pmatrix}$
B) $\begin{pmatrix} 4 \\ -2 \end{pmatrix}$
C) $\begin{pmatrix} 2 \\ 4 \end{pmatrix}$
D) $\begin{pmatrix} 4 \\ 2 \end{pmatrix}$

6. **Find the magnitude of vector v** (Round to 2 significant figure).



A) 6.7
B) 7.5
C) 45
D) 10

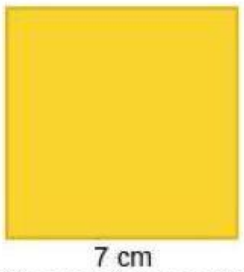
7.



The point K is reflected in the line x = 2.
What will its new coordinates be?

A) (-2,4)
B) (2,4)
C) (2,0)
D) (0,0)

8.



This square is to be enlarged by a scale factor of 7.

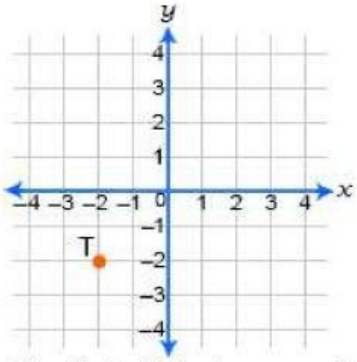
What will be the length of the new square?

Length = _____ cm

A) 1
B) 35
C) 5
D) 49

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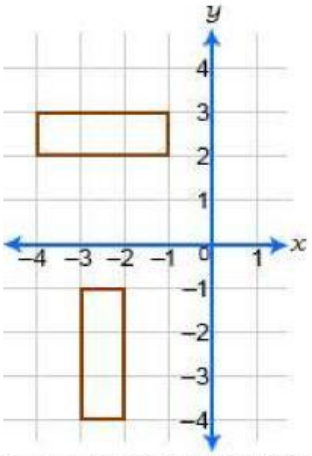
9.



When T is reflected in the line $y = -x$, **what will its new coordinates be?**

A) $(2, -2)$
B) $(2, 2)$
C) $(-2, -2)$
D) $(-2, 2)$

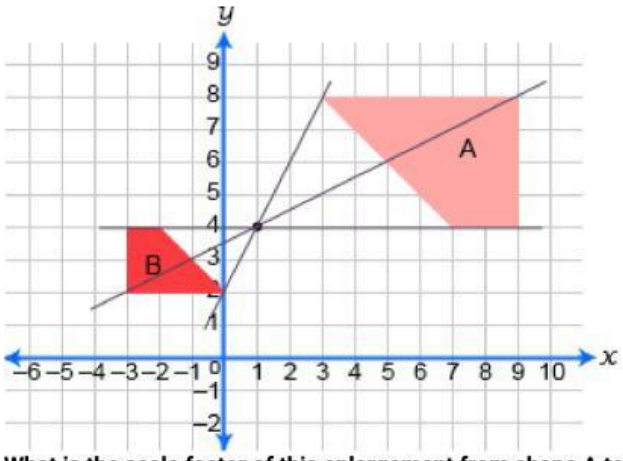
10.



This image shows the quadrilateral is _____

A) rotated about the origin
B) reflected in the *x*-axis
C) reflected in the *y*-axis
D) translated

11.



What is the scale factor of this enlargement from shape A to shape B centred at (1, 4)?

A) 2
B) $\frac{-1}{2}$
C) $\frac{1}{2}$
D) -2

12. Given some vectors:

$$\mathbf{A} = \begin{pmatrix} 6 \\ -9 \end{pmatrix} \mathbf{B} = \begin{pmatrix} -7 \\ 3 \end{pmatrix} \mathbf{C} = \begin{pmatrix} 2 \\ 8 \end{pmatrix}$$

The result of **2A+B-C** is ...

A) $\mathbf{D} = \begin{pmatrix} 17 \\ 13 \end{pmatrix}$
B) $\mathbf{D} = \begin{pmatrix} 3 \\ -23 \end{pmatrix}$
C) $\mathbf{D} = \begin{pmatrix} 3 \\ 13 \end{pmatrix}$
D) $\mathbf{D} = \begin{pmatrix} 17 \\ -23 \end{pmatrix}$

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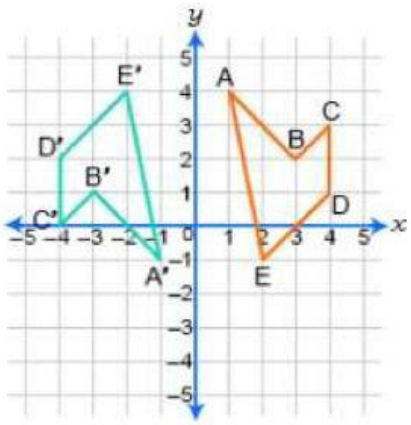
37. The point $(-2, -2)$ is translated with vector $\begin{pmatrix} 0 \\ 5 \end{pmatrix}$ and then reflected in the y-axis. **What will its final coordinates be?**

A) $(-2, 3)$
B) $(2, 3)$
C) $(2, -3)$
D) $(-2, -3)$

38. The point $(12, 6)$ is reflected in the x-axis and then reflected in the y-axis. **What are the coordinates of the final image?**

A) $(-6, -12)$
B) $(-12, -6)$
C) $(-6, 12)$
D) $(12, -6)$

39.



Which of the following combined transformations could be used to create this image?

A) A rotation of 180^o about the origin followed by a translation
B) A rotation of 90^o anticlockwise about the origin followed by a reflection in the x-axis
C) A reflection in the y-axis followed by a reflection in the x-axis
D) A reflection in the y-axis followed by a translation

40. In a class of 28 students, 10 take physics, 16 take chemistry and 9 take neither physics nor chemistry. **What is the probability that the students chosen at random from this class takes physics but not chemistry?**

A) $\frac{7}{28}$
B) $\frac{3}{28}$
C) $\frac{10}{28}$
D) $\frac{26}{28}$

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