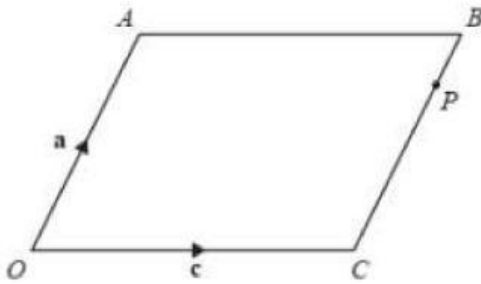


1.



$OABC$ is a parallelogram.

$\vec{OA} = a$ and $\vec{OC} = c$

P is the point on CB such that $CP : PB = 3 : 1$.

Find $\vec{OP}$ in terms of a and/or c , in its 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 $|\vec{AB}|$

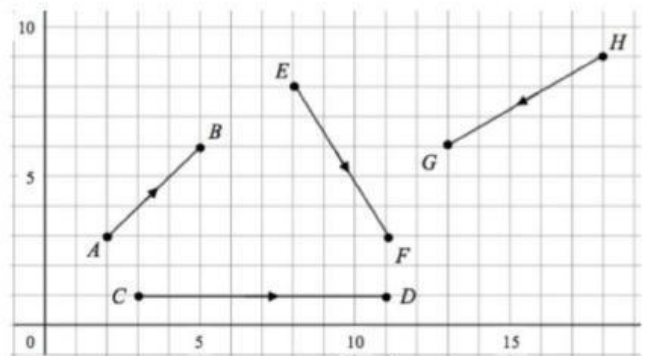
- A) $\sqrt{68}$
- B) 5
- C) $\sqrt{148}$
- D) 10

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) $\begin{pmatrix} 7 \\ 0 \end{pmatrix}$

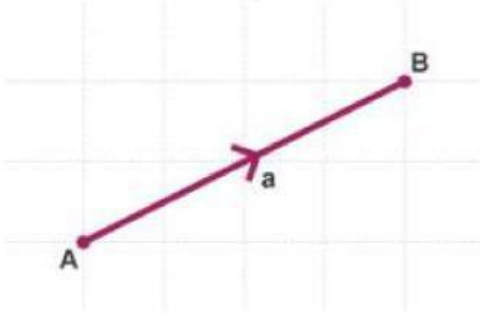
4. The following diagram shows some vectors in a grid.



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

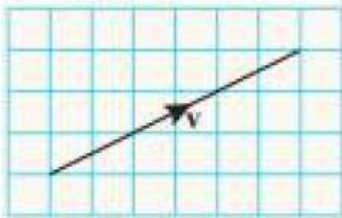
- A) $\vec{AB}$
- B) $\vec{HG}$
- C) $\vec{EF}$
- D) $\vec{CD}$

5. Which column vector represents vector AB ?



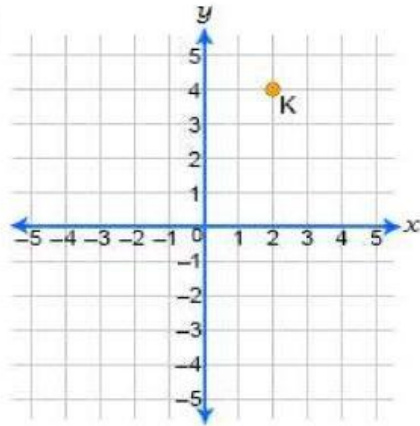
- A) $\begin{pmatrix} -4 \\ -2 \end{pmatrix}$
 B) $\begin{pmatrix} 4 \\ -2 \end{pmatrix}$
 C) $\begin{pmatrix} 2 \\ 4 \end{pmatrix}$
 D) $\begin{pmatrix} 4 \\ 2 \end{pmatrix}$

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.



7 cm

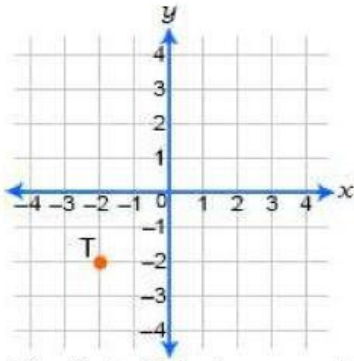
This square is to be enlarged by a scale factor of 7.

What will be the length of the new square?

Length = _____ cm

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

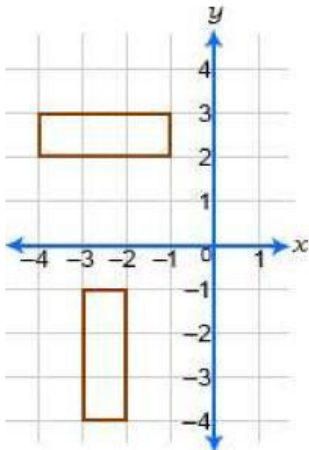
9.



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) $(-2, 2)$

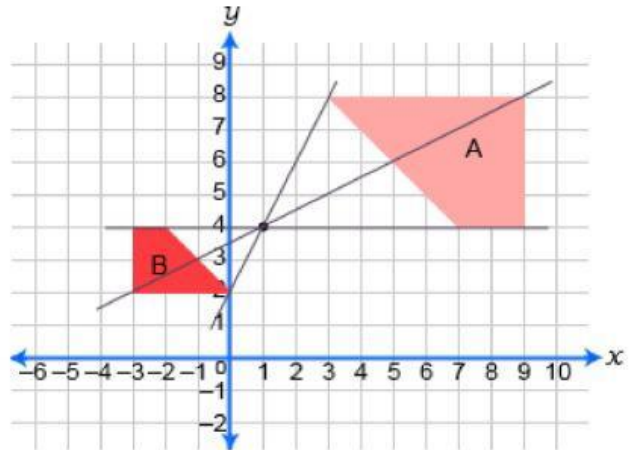
10.



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:

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

The result of $2\mathbf{A} + \mathbf{B} - \mathbf{C}$ 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) $\mathbf{D} = \begin{pmatrix} 17 \\ -23 \end{pmatrix}$

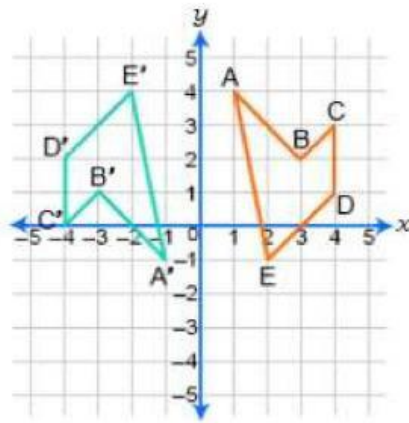
37. The point $(-2, -2)$ is translated with vector $\begin{pmatrix} 0 \\ 5 \end{pmatrix}$ and then reflected in the y -axis. **What will its final coordinates be?**

- 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° about the origin followed by a translation
- B) A rotation of 90° 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) $\frac{26}{28}$