



# New Maths GCSE: A13 - Describing $f(x)$ Transformations of Functions

Name:.....

Date:.....

Describe the transformation from

$y = f(x)$  to  $y = 3f(x)$

- A** Stretch in the x-axis, scale factor 3
- B** Stretch in the y-axis, scale factor 3
- C** Translation by the vector  $\begin{pmatrix} 0 \\ 3 \end{pmatrix}$
- D** Stretch in the x-axis, scale factor  $\frac{1}{3}$

Correct Answer: A B C D

Explanation:

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Describe the transformation from

$y = f(x)$  to  $y = f(x) + 5$

- A** Stretch in the y-axis, scale factor 5
- B** Translation by the vector  $\begin{pmatrix} 5 \\ 0 \end{pmatrix}$
- C** Translation by the vector  $\begin{pmatrix} 0 \\ 5 \end{pmatrix}$
- D** Translation by the vector  $\begin{pmatrix} 0 \\ -5 \end{pmatrix}$

Correct Answer: A B C D

Explanation:

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Describe the transformation from

$y = f(x)$  to  $y = f(4x)$

- A** Stretch in the y-axis, scale factor 4
- B** Translation by the vector  $\begin{pmatrix} 4 \\ 0 \end{pmatrix}$
- C** Stretch in the x-axis, scale factor  $\frac{1}{4}$
- D** Stretch in the x-axis, scale factor 4

Correct Answer: A B C D

Explanation:

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Describe the transformation from

$y = f(x)$  to  $y = f(x + 6)$

- A** Translation by the vector  $\begin{pmatrix} 0 \\ -6 \end{pmatrix}$
- B** Translation by the vector  $\begin{pmatrix} -6 \\ 0 \end{pmatrix}$
- C** Translation by the vector  $\begin{pmatrix} 0 \\ 6 \end{pmatrix}$
- D** Translation by the vector  $\begin{pmatrix} 6 \\ 0 \end{pmatrix}$

Correct Answer: A B C D

Explanation:

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Describe the transformation from

$y = f(x)$  to  $y = -f(x)$

- A** Rotation  $180^\circ$  about the origin
- B** Reflection in the line  $y = x$
- C** Reflection in the y-axis
- D** Reflection in the x-axis

Correct Answer: A B C D

Explanation:

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Describe the transformation from

$y = f(x)$  to  $y = f(x - 7)$

- A** Translation by the vector  $\begin{pmatrix} 7 \\ 0 \end{pmatrix}$
- B** Translation by the vector  $\begin{pmatrix} -7 \\ 0 \end{pmatrix}$
- C** Translation by the vector  $\begin{pmatrix} 0 \\ -7 \end{pmatrix}$
- D** Translation by the vector  $\begin{pmatrix} 0 \\ 7 \end{pmatrix}$

Correct Answer: A B C D

Explanation:

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Describe the transformation from

$y = f(x)$  to  $y = \frac{1}{2} f(x)$

- A** Stretch in the y-axis, scale factor 2
- B** Stretch in the x-axis, scale factor 2
- C** Stretch in the y-axis, scale factor  $\frac{1}{2}$
- D** Stretch in the x-axis, scale factor  $\frac{1}{2}$

Correct Answer: A B C D

Explanation:

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Describe the transformation from

$$y = f(x) \text{ to } y = f(-x)$$

- A** Rotation  $180^\circ$  about the origin
- B** Reflection in the x-axis
- C** Reflection in the y-axis
- D** Reflection in the line  $y = x$

Correct Answer: A B C D

Explanation:

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Describe the transformation from

$$y = f(x) \text{ to } y = f(x + 1) - 5$$

- A** Translation by the vector  $\begin{pmatrix} -5 \\ 1 \end{pmatrix}$
- B** Translation by the vector  $\begin{pmatrix} 1 \\ -5 \end{pmatrix}$
- C** Translation by the vector  $\begin{pmatrix} -5 \\ -1 \end{pmatrix}$
- D** Translation by the vector  $\begin{pmatrix} -1 \\ -5 \end{pmatrix}$

Correct Answer: A B C D

Explanation:

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Describe the transformation from

$$y = f(x) \text{ to } y = f\left(\frac{1}{5}x\right)$$

- A** Stretch in the y-axis, scale factor  $\frac{1}{5}$
- B** Stretch in the x-axis, scale factor  $\frac{1}{5}$
- C** Stretch in the y-axis, scale factor 5
- D** Stretch in the x-axis, scale factor 5

Correct Answer: A B C D

Explanation:

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Describe the transformation from

$$y = f(x) \text{ to } y = f(x - 2) + 3$$

- A** Translation by the vector  $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$
- B** Translation by the vector  $\begin{pmatrix} 3 \\ -2 \end{pmatrix}$
- C** Translation by the vector  $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$
- D** Translation by the vector  $\begin{pmatrix} -2 \\ -3 \end{pmatrix}$

Correct Answer: A B C D

Explanation:

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