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VCE Mathematical Methods ½
Transformations [2.4]
Test

15 Marks. 19 Minutes Writing.

Results:

Test	_____ / 15

Section A: Test Questions (15 Marks)

Question 1 (3 marks)

Tick whether the following statements are **true** or **false**.

	True	False
a. The image of a transformation is the point before the transformation is applied.		
b. Reflection in the x-axis makes the y value negative of what it was.		
c. When a point undergoes a dilation by a factor 3 from the y-axis, we can describe it as $x' = 3x$.		
d. The transformation $x' = 2(x - 2)$, indicates a translation of 2 units left, and a dilation by a factor 2 from the x-axis.		
e. $y' = 2y + 1$ and $y' = 2\left(y + \frac{1}{2}\right)$ result in the same transformed function.		
f. A transformation that maps $y = x^2$ to $y = 9x^2$ could be a dilation by factor 3 from the y-axis.		

Space for Personal Notes

Question 2 (2 marks)

The series of transformations given by "a dilation by a factor of 3 from the x-axis, followed by a translation of 8 units up", yields the exact same result as the series of transformations given by "a translation by a units up, followed by a dilation by a factor of b from the x-axis".

Find the values of a and b.

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Question 3 (3 marks)

Consider the following function: $f(x) = (x + 1)^2$
Apply the following transformations below to the function above.

Dilation by a factor of $\frac{1}{4}$ from the y-axis

Dilation by a factor of 2 from the x-axis

Translation by 2 units in the negative direction of the x-axis

Translation by 9 units in the positive direction of the y-axis

Reflection in the y-axis

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Question 4 (3 marks)

Consider the following functions:

$$f(x) = \sqrt{x + 2}$$

$$g(x) = -2\sqrt{7 - 2x} + 3$$

Find the set of transformations that maps $f(x)$ to $g(x)$.

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Question 5 (2 marks)

Consider the following functions:

$$f_1(x) = x^3$$

$$f_2(x) = -2(3x + 1)^3 - 1$$

Find the set of transformations that maps the function f_1 into f_2.

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Question 6 (3 marks)

For the function $f(x) = \sqrt{x+2}$, the function f is dilated by a factor of $\frac{5}{4}$ from the x-axis, translated 2 units in the negative x-direction and then is reflected in the y-axis to produce the function g.

Find the rule for $g(x)$.

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VCE Mathematical Methods ½

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