

## Core 3 Differentiation Answers

<p>(b) <math>\frac{dy}{dx} = \frac{(2x+1)3 - 2(3x+1)}{(2x+1)^2} = \frac{6x+3-6x-2}{(2x+1)^2}</math></p> <p><math>= \frac{1}{(2x+1)^2}</math></p> <p><b>Alternative</b>  <math>-2(3x+1)(2x+1)^{-2} + 3(2x+1)^{-1}</math> (M1A1)</p> <p><math>= \frac{1}{(2x+1)^2}</math> (A1)</p>	<p>M1</p> <p>A1</p> <p>A1</p>	<p>3</p>	<p>use of quotient rule</p> <p>AG (no errors)</p> <p><b>Alternative:</b>  <math>y = \frac{3}{2} - \frac{1}{2}(2x+1)^{-1}</math> M1A1</p> <p><math>\frac{dy}{dx} = (2x+1)^{-2}</math> A1</p> <p><math>= \frac{1}{(2x+1)^2}</math> AG</p>
<p>2(a) <math>y = (3x-1)^{10}</math></p> <p><math>\frac{dy}{dx} = 10(3x-1)^9 \times 3</math></p> <p><math>= 30(3x-1)^9</math></p>	<p>M1 A1</p>	<p>2</p>	<p>M1 for <math>a(3x-1)^9</math> where <math>a = \text{constant}</math></p>
<p>6(a)(i) <math>y = (4x^2 + 3x + 2)^{10}</math></p> <p><math>\frac{dy}{dx} = 10(4x^2 + 3x + 2)^9(8x + 3)</math></p>	<p>M1</p> <p>A1</p>	<p>2</p>	<p>For <math>f(x)( )^9</math> where <math>f(x) \neq k</math> and is linear</p>
<p>2(a) <math>4(x-1)^3</math> or in expanded form</p>	<p>B1</p>	<p>1</p>	<p>allow <math>-4(1-x)^3</math></p>

Why so short?

Because the techniques learnt are embedded and checked in questions on other topics.