

Question	Answer	Marks	AOs	Guidance	
8	<p><b>DR</b></p> $\int_8^a 2x^{\frac{1}{3}} - 7x^{-\frac{1}{3}} dx = 45$ $\left[ \frac{2x^{\frac{4}{3}}}{\left(\frac{4}{3}\right)} - \frac{7x^{\frac{2}{3}}}{\left(\frac{2}{3}\right)} \right]_8^a (= 45)$ $\frac{3}{2}a^{\frac{4}{3}} - \frac{21}{2}a^{\frac{2}{3}} - \left( \frac{3}{2}(8)^{\frac{4}{3}} - \frac{21}{2}(8)^{\frac{2}{3}} \right) (= 45)$ $\frac{3}{2}a^{\frac{4}{3}} - \frac{21}{2}a^{\frac{2}{3}} - (24 - 42) (= 45)$ $a^{\frac{4}{3}} - 7a^{\frac{2}{3}} - 18 = 0$ $\left( a^{\frac{2}{3}} - 9 \right) \left( a^{\frac{2}{3}} + 2 \right) = 0$ $a^{\frac{2}{3}} = 9 \quad \left( \text{and } a^{\frac{2}{3}} = -2 \right)$ <p><math>a = 27</math> only</p>	<p><b>M1*</b></p> <p><b>A1</b></p> <p><b>A1</b></p> <p><b>Dep*M1</b></p> <p><b>A1</b></p> <p><b>M1</b></p> <p><b>M1</b></p> <p><b>A1</b></p> <p><b>A1</b></p> <p><b>[9]</b></p>	<p><b>3.1a</b></p> <p><b>1.1</b></p> <p><b>1.1</b></p> <p><b>1.1</b></p> <p><b>1.1</b></p> <p><b>1.1</b></p> <p><b>1.1</b></p> <p><b>1.1</b></p> <p><b>3.1a</b></p> <p><b>1.1</b></p> <p><b>2.2a</b></p>	<p>If <math>a = 27</math> with no working then 0/9</p> <p>M1 – attempt integration (increase in power by 1 for at least 1 term)</p> <p>A1 – 1 term correct (accept unsimplified)</p> <p>A1 – both correct (accept unsimplified)</p> <p><math>F(a) - F(8)</math></p> <p>oe</p> <p>Equate integrated expression to 45 – dependent on both previous M marks</p> <p>Attempt to solve quadratic in <math>a^{\frac{2}{3}}</math></p>	<p><b>SC</b> if M0 for fourth M mark then award</p> <p>B1 for <math>a^{\frac{2}{3}} = 9</math></p> <p>B1 <math>a = 27</math> only</p>