

. Integration

1	a)		
	$x^2 + 5 = 8 - 2x$	M_1	Diagram
	$x^2 + 2x - 3 = 0$	A_1	
	$(x-1)(x+3) = 0$	B_1	
	$X = 1 \text{ or } x = -3$	B_1	
	$C(-3, 14)$		
	$D(1, 6)$		
	b)		
	$\int_3^1 (x^2 + 5) dx$	M_1	
	$\left[\frac{1}{3} x^3 + 5x \right]_3^1$	M_1	
	$\left(\frac{1}{3} + 5 \right) - (-9 - 15)$		
	$5\frac{1}{3} + 24$	A_1	
	$= 29\frac{1}{3} \text{ squnits}$		
	c)	M_1	
	$\frac{1}{2}(14 + 6) \times 4 = \text{Area}$	A_1	
	$\therefore A = 2 \times 20$		
	$= 40 \text{ squnits}$		
	d)	B_1	
	$40 - 29\frac{1}{3}$		
	$= 10\frac{2}{3} \text{ sq units}$		
		10	

1. $S_{10} = 100$
 $\int_2^5 (x-1)(x-2) dx$
 $x-2$
 $= \int_2^5 x - 1 dx$
 $= \left[\frac{x^2}{2} - x \right]_2^5$

2. $\int (x^2 + 1) dx = 2a$
 $\left(\quad \right)_0^a$

$$3 - 1$$

$$\frac{a^3}{3} + \frac{a}{1} - 0 = 2a$$

$$a^3 + 3a = 6a$$

$$a^3 = 3a$$

$$(a^3 - 3a) = 0$$

$$a(a^2 - 3) = 0$$

$$a = 0$$

$$\text{or } 3 = \pm 1.732$$