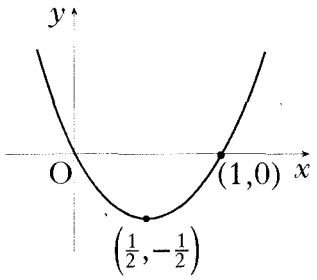
Integration

Answers

2018 P1 Q10	$y = 2x^3 - \frac{3}{2}x^2 + 4x - 4$	4
2018 P2 Q1	$\frac{32}{3}$ (units^2)	4
2017 P1 Q10	$\frac{8}{3}$ $\frac{1}{2}$	5 4
2017 P1 Q15	(a) a = -5, b = 3 (b) 10 (c) -6	2 1 1
2016 P2 Q3	$\bullet^2 \quad -1 \mid 2 \quad -9 \quad 3 \quad 14$ $\qquad\qquad\quad -2 \quad 11 \quad -14$ $\qquad\qquad 2 \quad -11 \quad 14 \quad 0$ remainder $= 0 \quad \therefore \ (x+1)$ is a factor $x = -1,\ 2,\ 3{\cdot}5$ $(-1,0)$ and $(2,0)$ 27	2 3 1 4
2016 P2 Q9	$f(x) = \frac{4}{3}x^{\frac{3}{2}} + 2x^{\frac{1}{2}} - 2$	4
2015 P1 Q12	$-\frac{1}{2}$	2
2015 P1 Q15	$T = \frac{1}{50}t^2 - 2t + 100$	6
2015 P2 Q4	$x = 2$ $\frac{19}{3}$	2 7

Spec, P1, O1	$\frac{3}{4}x^2 - \frac{1}{2}x^{-1} + C$	
Spec, P1, O13	$y = 2x^2 - 2x^3 + 5$	4
Exp, P1, O3	$\frac{1}{12}$	3
Spec, P2, O2	$2x^2 - x^{-1} + c$	4
Exp, P2, O4	$\frac{27}{4}$ units^2	5
2014 P2 O7	$10\frac{2}{3} \times 300 = 3200\,\text{m}^2$ 800m^2	5 5
2013 P2 O4	$\frac{27}{4}$ units^2	6
2011 P2 O4	$\frac{63}{4} + \frac{16}{3} = \frac{253}{12}$ units^2	10
2008 P2	$50\frac{2}{3}$	8
2007 P1	(*a*) To cut the x-axis, $y = 0$. So $0 = x^3 - 4x^2 + x + 6$ $= (x - 3)(x^2 - x - 2)$ $= (x - 3)(x - 2)(x + 1)$ So graph cuts x-axis at $x = -1, 3, 2$. (*b*) (2,0) (*c*) $\frac{22}{3}$	1 3 5
2007 P2	(*a*) (i) $a = 2, b = 4$ (ii) $k = \frac{3}{4}$ (*b*) $y = \frac{1}{4}x^3 - \frac{9}{4}x^2 + 6x + 6$	3 4

2006 P1	(*a*) $\frac{5}{4}$ or equivalent (*b*) $\frac{9}{2}$ or equivalent	4 3
2006 P2	$y = 2x^2 - 2x^3 + 5$	4
2005 P2	$2x^2 + x^{-1} + c$	4
2005 P2	36	8
2004 P1	(*a*) $a = 6,\ b = 2$ (*b*) $f(x) = 2x^3 - 6x^2 + 8$	3 5
2004 P2	$\frac{2}{3}$	8
2003 P2	$A = \int_{42\frac{2}{3}} [(x^2 + 2x) - (x^3 - x^2 - 6x)]\ dx$	5
2002W P1	$\frac{3}{4}x^{\frac{4}{3}} - 2x^{\frac{1}{2}} + c$	4
2002W P2	$\int_{-5}^{0} (f(x) - (-6))dx + \int_{0}^{5} (g(x) - (-6))dx$ $63\frac{17}{36}$ (*b*) 6 kilowatts	7 1
2002 P2	$\text{Area} = \int_{0}^{5} ((1 + 10x - 2x^2) - (1 + 5x - x^2))dx$ $20\frac{5}{6}$	6
2002 P2	$v = \int (2(4-t)^{\frac{1}{2}})dt$ use $v = 0,\ t = 0$ to find c $v = -\frac{4}{3}(4-t)^{\frac{3}{2}} + \frac{32}{3}$	4
2001 P2	$\frac{1}{3}x^3 + 4x^{-1} + c$	4

2001 P2	$40\frac{1}{2}$ units^2	7
2000 P1	(*a*) (i) $x = \frac{1}{3}$ and $x = 3$ (ii) parallel and coincident (*b*) $21\frac{1}{3}$	4 1 5
2000 P2	(*a*) $y = 4x - x^2$ (*b*) $\int_2^k$(function from (*a*)) $= -\frac{1}{3}x^3 + 2x^2$ $= -\frac{1}{3}k^3 + 2k^2 - \left(\frac{-8}{3} + 8\right)$	2 3
Specimen 2 P1	(*a*) $f(g(x)) = x^2 - 1,\ g(f(x)) = (x-1)^2$ (*b*) $h(x) = x^2 - 1 + x^2 - 2x + 1 = 2x^2 - 2x$  (*c*) $Area = \int_0^1 \left(2x^2 - 2x\right)dx = \frac{1}{3}$	3 3 4
Specimen 2 P1	$\int \left(x^{\frac{1}{2}} - 5x^{-\frac{3}{2}}\right)\ dx = \frac{2}{3}x^{\frac{3}{2}} + 10x^{-\frac{1}{2}} + c$	4
Specimen 1 P1	1	5
Specimen 1 P2	(*a*) $y = -5x - 3$ (*b*) B = (–1,2) (*c*) area = $1\frac{1}{3}$	3 4 3