

ANSWERS

(1 a) $\frac{x^{\pi+1}}{\pi+1} - \ln |\sec x| + \frac{\pi^x}{\ln \pi} - x + C$; (1 b) $\frac{1}{2} x^2 + \ln |x^2 + x - 2| + C$; (1 c) $\frac{175}{4} = 43.75$

(1 d) $2(\sqrt{x} + 4) - 8 \ln(\sqrt{x} + 4) + C = 2\sqrt{x} - 8 \ln(\sqrt{x} + 4) + C$

(1 e) $-x^2 \cos x + 2x \sin x + 2 \cos x + C$; (1 f) $\ln |x| - \frac{3}{x} - 2 \ln |x + 4| + C$

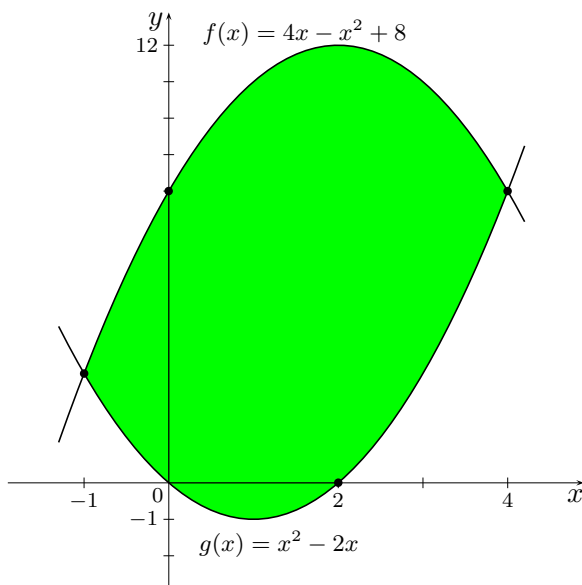
(2 a) factor then F39 or complete square then F26: $\ln \left| x + 2 + \sqrt{x^2 + 4x - 5} \right| + C$

(2 b) substitution then F12: $-\frac{1}{12} \ln \left| \frac{x^2 - 1}{x^2 + 5} \right| + C$

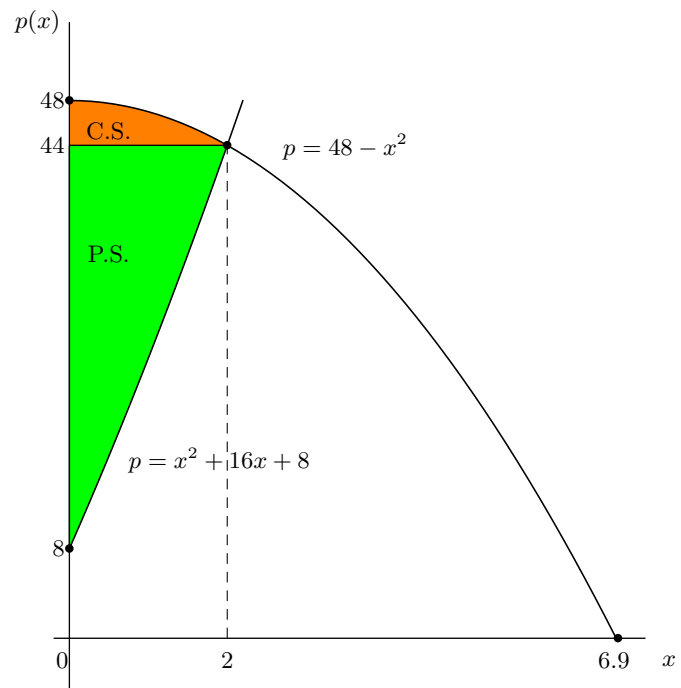
(4 a) point of equilibrium: (2, 44)

(4 b)

(3)



Area = $\frac{125}{3} \approx 41.67$ square units



(4 c) P.S.=37.33

(5) 6.6705; (6 a) $y = \frac{1}{5} x^5 + \frac{1}{4} e^{2x} + \frac{1}{2} x + \frac{15}{4}$; (6 b) $y = x \ln x - x + 6$

7(a) $y = \sqrt[3]{\frac{3}{4} x - 3 \ln(x)} + C$; (7 b) $y = C \sqrt{x^2 + 1}$; (8 a) about 25 persons; (8 b) about 5.4 weeks

(9 a) $-\frac{1}{6}$; (9 b) $-\infty$; (10 a) $-\infty$, divergent; (10 b) converges to $-\frac{3}{2}$

(11 a) $a_5 = \frac{25}{5}$, $a_6 = \frac{29}{6}$, $a_7 = \frac{33}{7}$, $a_8 = \frac{37}{8}$; (11 b) $a_n = \frac{4n+5}{n}$; (11 c) converges to 4

(12) the first 6 terms are: 1, 3, 5, 7, 9, 11; $a_n = 2n - 1$; (13) $a_n = (-1)^{n+1} \frac{n!}{5^n}$

(14 a) $\pm \frac{5}{3}$, divergent; (14 b) converges to 1; (15) \$2188.10

(16 a) divergent by n.T.T.; (16 b) convergent by geometric test to $\frac{9}{2}$; (17) \$1975.90