

MathU141 Fall 06 Final Exam: Short answers (to check your work).

1.

(a) $y' = 20x^3 + 12x^2 + 6x + 2$

(b) $y' = 1/(x-1) - (2/x)$

(c) $y' = (x^3 + x^2 + x + 1)^{-2} (3x^2 + 2x + 1)$

(d) $y' = 3e^{(3x)} \cos(2x) - 2e^{(3x)} \sin(2x)$

(e) $y' = (2/3) (x^2 + x + 1)^{-1/3} (2x + 1)$

2.

max: (0,25)

min: (-3,-56), (3,-56)

infl: (-sqrt(3),-20), (sqrt(3),-20)

3.

(a) $(1/3)x^3 + (5/2)x^2 + 2x + C$

(b) $(1/16)x^2 + 8 \ln(x) + C$

(c) $-2\cos(x) + (3/5)\sin(5x) + C$

(d) $(8/3)3^{(3/2)} + e^6 - 1$

4.

(a) $-(1/3)3^{(2/3)} = -.6933 \text{ cm/hr}$

(b) $9 - (1/5)3^{(5/3)} = 7.751 \text{ cm}$

5. (a) 13.25, (b) 16.25, (c) 14.66

6. 60 ft by 22.5 ft

7. 10 hrs, 58.86 mg/ml

8.

(a) $s'(t) = -.6t + 2.4$

(b) $s(t) = -.3t^2 + 2.4t + 6$

(c) 4 sec

(d) 10.8 meters

(e) 10 sec

9.

(a) (i) $A(t) = 90e^{(-.006301t)}$

(ii) 330.01 min

(b) (i) $P' = .15P - 450000$

(ii) 3,000,000 fish

10. 1/4

11.

(a) $\int_0^8 r(t) dx$

(b) 20.5

(c) 0 to 3: 10, 4 to 8: 5.5