

Review for Exam 3 – Solutions

1. Linear Approximations. a) 5.3 b) 4.7 c) 0.98 d) 2.962963. Calculator value: 2.962496.
e) 2.00625. Calculator value: 2.00622. f) $200+15(2)=230$ dollars. g) $2000+100(1/2)=2050$
bacteria.
2. Implicit Differentiation. a) $dy/dx = -(2x + y)/x$ b) $dy/dx = (x^2 + 4y)/(y^2 - 4x)$ c)
 $dy/dx = (e^y + 2x)/(2y - xe^y)$
3. Tangent Line. a) $y = -3/2x + 13/2$ b) $y = 2x - 1$ c) $y = 2x - 2$
4. Related Rates. a) $1/(10\pi)$ cm per min. b) -6.87 ft per sec. c) $3/(20\pi)$ cm per min.
d) $-5/3$ ft per sec. e) -160 bass per year f) $1/\pi$ in per min.
5. Definite and Indefinite Integrals. a) x^4+2x^3-3x+c b) $2/3x^{3/2}+4/x+c$ c) $3/2x^{4/3}+1/12 \cdot$
 x^3+c d) -9 e) $1/21 \cdot (3x+5)^7+c$ f) 52 g) $\sqrt{34}-3\sqrt{2}=1.59$ h) $\ln|x|+1/x+c$
i) $1/4 \ln|4x+1|+c$ j) $1/3 \ln|x^3+1|+c$ k) $1/2e^{2x}-1/2e^{-2x}+c$ l) $4/\ln 3=3.64$ m)
 $1/5 \sin(5x+1)+c$ n) 1
6. Approximate Integration. a) $L = 27.496, R = 27.912$ b) $L = .759, R = .741$ c) With
 $n = 100$, left sum = right sum = 1.4 d) With $n = 300$, left sum = right sum = 81 e)
With $n = 1000$ left sum = right sum = 6.0
7. Area. a) 5.33 b) 1.33 c) 2 d) $32/3$ e) 2.61 f) 1 g) $9/2$ h) 4 i) $1/6$ j)
 $1/2$ k) $1/2$
8. Applications. (a) 16.4 miles. (b) With $n = 300$, get $L=R=13$ milligrams. (c) 4 ft (d)
45 ft (e) a) 1.59 ft b) $\sqrt{t^2+9}+3$ (f) 72.54 millions (g) $4192.834 \approx 4193$ thousands of
barrels