

Math 165

Review Sheet 2 Answers

1. a) $f'(x) = 7x^6 + 15x^4 + 8x^3$
b) $g'(x) = \frac{-x^4 - 2x^3 - 2x - 1}{(x^3 - 1)^2}$
c) $f'(t) = \frac{3}{2}t^{\frac{1}{2}} + \frac{5}{2t^{\frac{3}{2}}}$
2. $(-\frac{3}{2}, \frac{9}{4})$
3. $a = \frac{3}{2}$, and $b = -6$.
4. a) $t = 2 \rightarrow s(2) = 17$
 $t = 3 \rightarrow s(3) = 18$
b) $t < 2$ and $t > 3$
5. a) 3
b) $-\frac{1}{2}$
6. $\frac{1 - \cos(x)}{\sin^2(x)}$
7. $y = \frac{1}{2}$
8. a) $-\tan(x)$
b) $\frac{x-1}{2\sqrt{x+1}(3x+1)^{4/3}}$
c) $\frac{\cos^2(3x)}{2\sqrt{x}} - 6\sqrt{x} \sin(3x) \cos(3x)$
d) $-\sin(x) \cos(\cos(x))$
e) $\frac{2}{e^{2x} + e^{-2x}}$
9. -10
10. $y - 1 = -\frac{4}{7}(x - 2)$ meets x-axis at $x = 15/4$
11. $y = -2x + \pi$
- 12.
13. $y'' = 0 \rightarrow t = 0, 2$
 $y'(0) = 0, y'(2) = -16, y(0) = 2, y(2) = -14$
14. $(\frac{r}{x} + s) x^r e^{xs}$
15. $\frac{3}{8}$
16. $\frac{1}{6}$
17. $\frac{1}{15}$
18. $y = \frac{7x+3}{2-3x}$
19. -3
20. $x = 1$
21. $\ln(2) + 3\ln(x) + \ln(y) - \frac{1}{2}\ln(z)$
22. $x = e^{(\ln(2))^2} = 2^{\ln 2}$
23. $-\infty$
24. $\ln(\frac{2}{3})$
25. $\ln(3) \cos(x) 3^{\sin(x)}$
26. $\frac{(x+1)^4(x-5)^6}{\sqrt{2x+1}} \left(\frac{-1}{2x+1} + \frac{4}{x+1} + \frac{6}{x-5} \right)$