

Practice Final Exam Answer Key

Math 132, Fall 2005

1. (a) 1 (b) $\frac{1}{6}$ (c) $\frac{1}{5}$ (d) -1

2. (a) $2x\sqrt{\sin x} + x^2 \frac{\cos x}{2\sqrt{\sin x}}$ (b) $\frac{(2x+1)\sqrt{x^2+1} - (x^2+x+1) \cdot \frac{1}{2}(x^2+1)^{-1/2} \cdot 2x}{x^2+1}$
(c) $\frac{\sin^5 \sqrt{x}}{2\sqrt{x}}$

3. $\frac{-1}{12}$

4. (a) $\frac{1}{45}(1+10x^3)^{3/2} + C$ (b) $\frac{2}{3}(x+1)^{3/2} - 2(x+1)^{1/2} + C$

5. (a) $-\frac{5}{12}$ (b) $\frac{2}{3}$

6. $y = \frac{5}{4}x - 3$

7. $\frac{5}{\sqrt{\pi}} \frac{m}{s}$

8. \$54.00

9. $\sum_{k=1}^4 k^3$ or $1^3 + 2^3 + 3^3 + 4^3$

10. (a) $\frac{20}{3}$ (b) $\frac{28}{3}$

11. (a) $x = 3$

(b) increasing on $(0, 3)$; decreasing on $(-\infty, 0) \cup (3, \infty)$

(c) concave down on $(-\infty, -\frac{3}{2})$; concave up on $(-\frac{3}{2}, 3) \cup (3, \infty)$

(d) local minimum at $x = 0$

(e) inflection point at $x = -\frac{3}{2}$

(f) horizontal asymptote $y = 1$, vertical asymptote $x = 3$

12. $y = -\frac{3}{2}\cos(2x) + 6x + \frac{5}{2}$

13. (a) $f(x)$ is continuous on $[0, 3]$ and differentiable on $(0, 3)$, because all polynomials are continuous and differentiable.

(b) $c = \frac{3}{2}$. Note that this is the answer to the corrected question, in which the points on the line are $(0, -9)$ and $(3, 33)$.