

**Answer Key**  
**Math 1281**  
**Fall 2002 Final Exam**

**Multiple Choice Problems**

- |      |       |
|------|-------|
| 1. C | 7. D  |
| 2. C | 8. C  |
| 3. D | 9. C  |
| 4. D | 10. A |
| 5. E | 11. E |
| 6. C | 12. A |

**Written Answer Problems**

13. a)  $\pi/2$                       b) 0
14. a)  $1/(2\sqrt{x}) + 3/x^4 - x^3$                       b)  $(2x - 2x^2) \cdot e^{-2x}$
15. a)  $10x / (5 - 2x^2)^2$                       b)  $-3x^4 + (\ln 3) \cdot 3^x$
16. a)  $-3x^2 \cdot \cos(1 + x^3) \cdot \exp[-\sin(1 + x^3)]$                       b)  $2 \tan x$
17.  $f'(x) = 2e^{2x} \cdot g'(e^{2x})$                       18.  $dy/dx = 2x / (x^2 + y - 1)$
19. a)  $f(x) \approx 1 - rx$                       b) 0.8                      20. vertical:  $x = 1/2$ ; horizontal:  $y = 1/2$
- 21.
- a) intervals of increase:  $(-\infty, -1), (1, \infty)$ ; interval of decrease:  $(-1, 1)$ ;
  - local maximum:  $x = -1$ , local minimum:  $x = 1$
  - b) interval of upward concavity:  $(0, \infty)$ ; interval of downward concavity:  $(-\infty, 0)$ ;
  - inflection point:  $x = 0$
22. 2500 ft<sup>2</sup>                      23. see solution set
24.  $(28/3) - (10/3) \cdot e^{-0.3x}$                       25.  $34/15 \approx 2.267$
26.  $(-1/3\pi) \cdot \cos(3\pi x) + C$                       27.  $\pi - 4$
28.  $(1/3) \cdot (e^{15} - 1)$                       29.  $f(x) = e^{2 \ln x} \cdot (1/x) = x$                       30.  $3\sqrt{3}$
31. a)  $3 \ln |x - 2| + C$                       b)  $(3/2) \cdot \exp(x^2) + C$
- 32.
- $$\int_{\frac{3-\sqrt{3}}{2}}^{\frac{3+\sqrt{3}}{2}} 3 - x - \frac{1}{x} dx$$