ANSWERS TO SHEET #1200.

PRACTICE FINAL TEST.

KEY

**1.** (a) 6 (b) $-2$
(c) 1 (d) $-\infty$

**2.** $y = 4x - 10,\ y = 12x - 42$

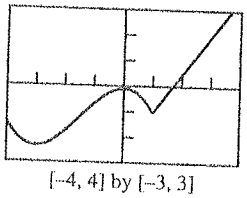
**3.** $6x^5 + 16x - 11$

**4.** $\dfrac{(x^2+3)\cos x - 2x\sin x}{x^4 + 6x^2 + 9}$

**5.** $\dfrac{12x^2y - 1}{15y^2 - 4x^3 - 8}$

**6.** (D)

**7.**



[−4, 4] by [−3, 3]

**8.** (a) $(-\infty, -1.393]$ and $[-0.209, \infty)$
(b) $[-1.393, -0.209]$
(c) $(-0.707, 0.707)$
(d) $(-\infty, -0.707)$ and $(0.707, \infty)$
(e) Min: $-5.204$ at $x \approx -0.209$;
Max: $-3.504$ at $x \approx -1.393$
(f) $(-0.707, -4.447)$, $(0.707, -1.618)$

**9.** (a) $f' = 0$: $x = -3, x = -1, x = 1$;
$f' > 0$: $x < -3, -1 < x < 1$;
$f' < 0$: $-3 < x < -1, x > 1$
(b) $f'' = 0$: $x = -2, x = 0$;
$f'' > 0$: $-2 < x < 0$
$f'' < 0$: $x < -2, x > 0$

**10.** (a) $\dfrac{28}{3} - \dfrac{4}{3}\sqrt{13} \approx 4.526$ in.
(b) $\approx 1552.5$ in$^3$ 1552.539 in$^3$

**11.** (B)

**12.** $x_2 \approx 0.736$

**13.** (a) $-243$ ft$^3$/sec (b) $-108$ ft$^2$/sec
(c) $-\dfrac{6}{\sqrt{146}} \approx -0.497$ ft/sec

**14.** 930 ft

**15.** $\displaystyle\int_3^{11} \left(5x^2 - \frac{3}{x}\right) dx$

**16.** (a) 30 (b) $\dfrac{95}{2}$
(c) $\dfrac{140}{3}$

**17.** (a) $-4$ (b) $-1$
(c) $-67$

**18.** $5 - \pi$

**19.** $\approx 4.985$

**20.** $18x - 21$

**21.** (a) 186 (b) $\dfrac{93}{5}$
(c) $\dfrac{2}{\sqrt{3}} \approx 1.155$

**22.** (E)

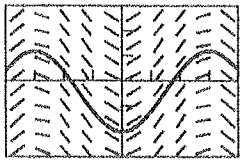
**23.** $\approx 10.783$

**24.** (E)

**25.** $\dfrac{1}{2}x^6 + \dfrac{1}{2x^2} + \dfrac{1}{7}e^{7x} + C$

**26.** $y = -\dfrac{1}{15}(-5x + 7)^3 - \dfrac{7}{15}$

**27.**



[−4, 4] by [−3, 3]

**28.** $\dfrac{1}{5}\sec^5 x + C$

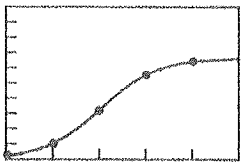
**29.** $\dfrac{1}{2}x^2 + 7x = -\cos(y^3) + C$

**30.** $\dfrac{x}{3}\sin(3x + 4) + \dfrac{1}{9}\cos(3x + 4) + C$

**31.** $\left(-\dfrac{1}{5}x^2 - \dfrac{2}{25}x - \dfrac{2}{125}\right)e^{-5x} + C$

**32.** $\approx 120.39$ g 120.3868

**33.** (a) $y = \dfrac{666.731}{1 + 28.432e^{-0.16462x}}$



[0, 50] by [0, 1000]

(b) $\approx 667$ coyotes
(c) Year: 1970; population: 333

**34.** (a) Right: $0 \le t < 3$; left: $3 < t \le 10$;
stopped: $t = 3$ seconds
(b) $-60$ ft (c) 87 ft

**35.** 2187.5 gal

**36.** $\dfrac{27}{2}$

**37.** (C)

**38.** $\dfrac{625\pi}{3}$

**39.** $\dfrac{2}{5}$

**40.** $\dfrac{1022}{27}$

**41.** 144 N-cm