

p362

$$1) \frac{4x^3}{3} + \frac{x^2}{2} + 3x + C \quad 2) \int 6x^{-1/3} dx = 9x^{2/3} + C$$

$$3) \int x + 8x^{-3} dx = \frac{x^2}{2} - 4x^{-2} + C \quad 4) 5\sin x - 2\tan x + C$$

$$7) f(x) = -3x^2 + C \quad 8) f(x) = 3x^3 + x + C$$

$$-2 = -3(1)^2 + C \quad 7 = 3(0)^3 + 0 + C$$

$$1 = C \quad 7 = C$$

$$f(x) = -3x^2 + 1 \quad f(x) = 3x^3 + x + 7$$

$$11) a(t) = -32$$

$$v(t) = -32t + 96$$

$$s(t) = -16t^2 + 96t + 0$$

$$a) v(t) = 0 \quad s(3) = 144 \text{ ft}$$

$$t = 3$$

$$9) f'(x) = 12x^2 + C \quad f(x) = 4x^3 + 5x + D$$

$$7 = 12(-1)^2 + C \quad -4 = 4(1)^3 - 5(1) + D$$

$$-5 = C \quad -3 = D$$

$$f'(x) = 12x^2 - 5 \quad f(x) = 4x^3 - 5x - 3$$

$$b) v(t) = 48 \quad t = 1.5 \text{ sec}$$

$$c) s(1.5) = 108 \text{ ft}$$

$$10) f'(x) = 2\sin x + C \quad f(x) = -2\cos x + 4x + D$$

$$4 = 2\sin(0) + C \quad -5 = -2\cos(0) + 4(0) + D$$

$$4 = C$$

$$-3 = D$$

$$f'(x) = 2\sin x + 4 \quad f(x) = -2\cos x + 4x - 3$$

$$21) \int_0^3 8 - 2x dx = \lim_{n \rightarrow \infty} \sum_{i=0}^n \left[8 - 2\left(\frac{3i}{n}\right) \right] \frac{3}{n}$$

$$\Delta x = \frac{3-0}{n}$$

$$x_i = 0 + \frac{3}{n}i$$

$$f(x_i) = 8 - 2\left(\frac{3i}{n}\right)$$

$$22) \Delta x = \frac{1-(-2)}{n}$$

$$x_i = -2 + \frac{3}{n}i$$

$$f(x_i) = 5 - \left(-2 + \frac{3i}{n}\right)^2$$

$$\int_{-2}^1 5 - x^2 dx = \lim_{n \rightarrow \infty} \sum_{i=0}^n \left[5 - \left(-2 + \frac{3i}{n}\right)^2 \right] \frac{3}{n}$$

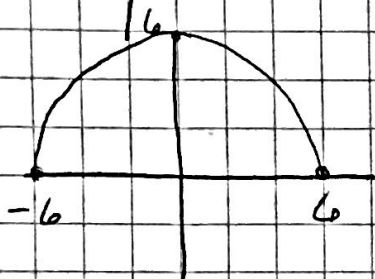
27)



$$\int_0^5 5 - |x-5| dx = \frac{1}{2}(5)(5)$$

$$= \frac{25}{2}$$

28)



$$\int_{-6}^6 \sqrt{36-x^2} dx = \frac{1}{2}\pi(6)^2$$

$$= 18\pi$$

29) a) $12+5=17$ b) $12-5=7$ c) $2(12)-3(5)=9$ d) $7(12)=84$

30) a) $4+-1=3$ b) $-(-1)=1$ c) 0 d) $-10(-1)=10$

33) $\frac{3-2}{4} = .25$

x	2	2.25	2.5	2.75	3
y	$\frac{2}{5}$	$\frac{32}{97}$	$\frac{8}{29}$	$\frac{32}{137}$	$\frac{1}{5}$

$$\frac{1}{2}(.25) \left[\frac{2}{5} + 2\left(\frac{32}{97}\right) + 2\left(\frac{8}{29}\right) + 2\left(\frac{32}{137}\right) + \frac{1}{5} \right] = .285$$

34) $\frac{1-0}{4} = .25$

x	0	.25	.5	.75	1
y	0	$\frac{3}{47}$.12856	.26647	$\frac{1}{2}$

$$\frac{1}{2}(.25) \left[0 + 2\left(\frac{3}{47}\right) + 2(.12856) + 2(.26647) + \frac{1}{2} \right] = .172$$

37) $\int_0^8 3+x dx = 3x + \frac{1}{2}x^2 \Big|_0^8 = \left[3(8) + \frac{1}{2}(8)^2 \right] - \left[3(0) + \frac{1}{2}(0)^2 \right] = 56$

38) $\int_2^3 x^4 + 4x - 6 dx = \frac{1}{5}x^5 + 2x^2 - 6x \Big|_2^3 = \left[\frac{1}{5}(3)^5 + 2(3)^2 - 6(3) \right] - \left[\frac{1}{5}(2)^5 + 2(2)^2 - 6(2) \right]$

$$= \frac{231}{5}$$

39) $\int_4^9 x^{\frac{3}{2}} dx = \frac{2}{5}x^{\frac{5}{2}} \Big|_4^9 = \frac{2}{5}(9)^{\frac{5}{2}} - \frac{2}{5}(4)^{\frac{5}{2}} = \frac{422}{5}$

40) $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \sec^2 t dt = \tan t \Big|_{-\frac{\pi}{4}}^{\frac{\pi}{4}} = \tan \frac{\pi}{4} - \tan \left(-\frac{\pi}{4}\right) = 1 - (-1) = 2$

2) p 363 #47 $f_{AV} = \frac{1}{9-4} \int_4^9 x^{-1/2} dx = \frac{1}{5} \left[2x^{1/2} \Big|_4^9 \right]$
 $= \frac{1}{5} (2\sqrt{9} - 2\sqrt{4})$
 $= \frac{1}{5} (6 - 4) = \frac{2}{5}$

$$\frac{2}{5} = \frac{1}{\sqrt{x}}$$

$$2\sqrt{x} = 5 \quad x = \frac{25}{4} \quad \text{average value of } \frac{2}{5}$$

$$\sqrt{x} = \frac{5}{2} \quad \text{occurs at } x = \frac{25}{4}$$

p 365 #11

a) $v(t) = 0$

$$\sin\left(\frac{\pi t}{4}\right) = 0$$

$$\frac{\pi t}{4} = 0 \text{ or } \pi \text{ or } 2\pi \text{ or } 3\pi \dots$$

$$t = 0 \text{ or } 4 \text{ or } 8 \text{ or } 12, \dots$$

t	4	8	
v(t)	+	-	+
	rt	left	right

Particle move right (0,4)(8,9) because v(t) is positive

b) $\int_0^9 \left| \sin\left(\frac{\pi t}{4}\right) \right| dt$

c) $a(t) = v'(t) = \left[\cos\left(\frac{\pi t}{4}\right) \right] \cdot \frac{\pi}{4}$ slowing down

$$a(3) = \left[\cos\left(\frac{3\pi}{4}\right) \right] \cdot \frac{\pi}{4} = \left(-\frac{\sqrt{2}}{2}\right) \frac{\pi}{4}$$

v(3) is pos a(3) is neg

$$v(3) = \sin\left(\frac{3\pi}{4}\right) = \frac{\sqrt{2}}{2}$$

d) $p(t) = \int v(t) dt$ $\int_0^3 \sin\left(\frac{\pi t}{4}\right) dt = p(3) - p(0)$

$$2.173555 = p(3) - (-4)$$

$$-1.8264 = p(3)$$

