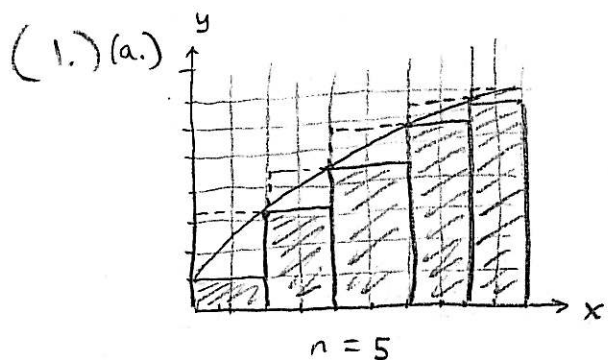


MATH 2 : SOLUTIONS TO PROBLEM SET #4

SECTION 5.1



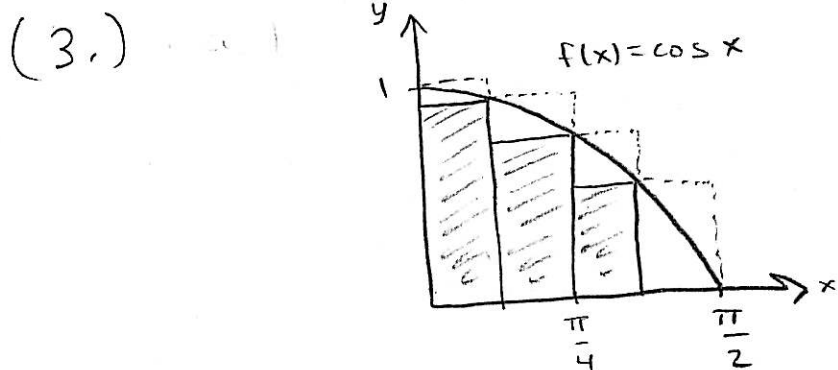
— = LEFT ENDPOINTS, LOWER BOUND
 --- = RIGHT ENDPOINTS, UPPER BOUND

LEFT ENDPOINTS : $2 \cdot 1 + 2 \cdot 3 + 2 \cdot 4.3 + 2 \cdot 5.3 + 2 \cdot 6.3$
 $= 2(19.9) = 39.8$ (ABOUT 40)

RIGHT ENDPOINTS : $2 \cdot 3 + 2 \cdot 4.3 + 2 \cdot 5.3 + 2 \cdot 6.3 + 2 \cdot 7.3$
 $= 51.8$ (ABOUT 52)

(b.) LEFT ENDPOINTS : $1 + 2.2 + 3 + 3.8 + 4.3 + 5 + 5.6$
 $+ 5.9 + 6.3 + 6.7 = 42.6$ (ABOUT 43)

RIGHT ENDPOINTS : SAME BUT $-1, +7$
 (ABOUT 49)

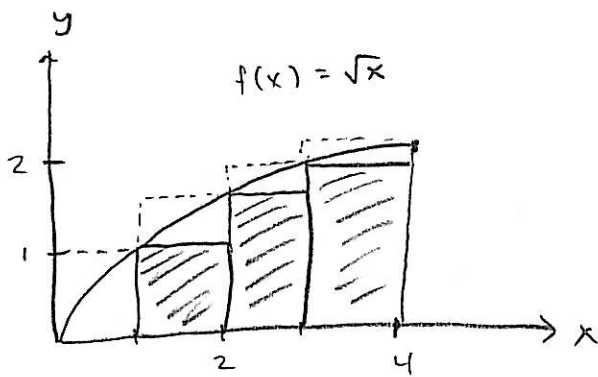


— = RIGHT ENDPOINTS, LOWER BOUND
 --- = LEFT ENDPOINTS, UPPER BOUND

(a.) RIGHT ENDPOINTS : $\frac{\pi}{8} \left(\cos \frac{\pi}{8} + \cos \frac{\pi}{4} + \cos \frac{3\pi}{8} + \cos \frac{\pi}{2} \right) = 0.7908$

(b.) LEFT ENDPOINTS : SAME BUT $+\frac{\pi}{8} = 1.1835...$

(4.)



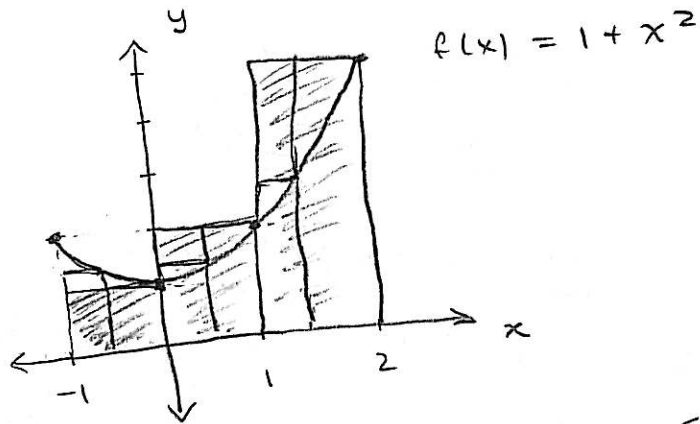
- = LEFT ENDPOINTS,
LOWER BOUND

--- = RIGHT ENDPOINTS,
UPPER BOUND

(a.) RIGHT ENDPOINTS : $1 + \sqrt{2} + \sqrt{3} + 2 = \boxed{6.146\dots}$

(b.) LEFT ENDPOINTS : SAME BUT $-2 = \boxed{4.146\dots}$

(5.) (a.)



RIGHT ENDPOINTS : 3 RECTANGLES : $1 + 2 + 5 = \boxed{8}$

6 RECTANGLES : $(1.25 + 1 + 1.25 + 2 + 3.25 + 5) \cdot \frac{1}{2} = \boxed{6.875}$

(b.) (INCLUDE ILLUSTRATION.)

LEFT ENDPOINTS : 3 RECTANGLES : $2 + 1 + 2 = \boxed{5}$

6 RECTANGLES : SAME BUT $-\frac{3}{2} = \boxed{5.375}$

(c.) (INCLUDE ILLUSTRATION.)

MIDPOINTS : 3 RECTANGLES : $1.25 + 1.25 + 3.25 = \boxed{5.75}$

6 RECTANGLES : $\boxed{5.9375}$

(d.) MIDPOINTS WITH 6 RECTANGLES (M6).

(11.) LOWER ESTIMATE: $\frac{1}{2} (0 + 6.2 + 10.8 + 14.9 + 18.1 + 19.4)$
 $= \boxed{34.7} \text{ ft}$

UPPER ESTIMATE: SAME BUT $+ \frac{1}{2} (20.2) = \boxed{44.8} \text{ ft}$

$\boxed{(12.)}$ (a.) $12 (30 + 28 + 25 + 22 + 24) = \boxed{1548} \text{ ft}$

(b.) $12 (28 + 25 + 22 + 24 + 27) = \boxed{1512} \text{ ft}$

(c) No, BECAUSE THE MOTORCYCLE IS SLOWING DOWN, THEN SPEEDING UP AGAIN (SO $v(t)$ IS NEITHER INCREASING OR DECREASING). EVEN IF IT APPEARED TO BE, BASED ON 12 SECOND INTERVALS, WE COULDN'T BE SURE HOW MUCH $v(t)$ IS FLUCTUATING IN BETWEEN THE DATA WE HAVE.

