Pg 612 #83, 85, 87, 89

(83) let c_i = # of seats in the i^{th} row

$c_i = 4(i-1)+20 = 4i+16$ ← $c_1 = 20$, $c_{30} = 136$

$$S_{20} = \sum_{i=1}^{30} (4i+16) = \frac{30(20+136)}{2}$$

$$= 15(156) = 2340$$

The auditorium contains 2340 seats.

(85) let b_i = # of bricks in the i^{th} row

$b_1 = 14$, $b_{18} = 31$ → $S_{18} = \sum_{i=1}^{18} b_i = \frac{18(14+31)}{2} = 9(45) = 405$

The brick patio contains 405 bricks.

★ no need for a formula in #85 because they tell you the first and last term

(87) let d_i = distance the object falls (m) during the i^{th} second

$d_i = 9.8(i-1)+4.9$
$= 9.8i - 4.9$

$d_1 = 4.9$
$d_{10} = 93.1$

$$S_{10} = \sum_{i=1}^{10}(9.8i - 4.9) = \frac{10(4.9+93.1)}{2}$$

$$= 10(98) = 980$$

The object falls 980 m in the first 10 seconds.

(89) let a_n = prize amt (\$) for the n^{th} place

a) $a_n = -25(n-1)+200$
$= -25n + 225$

$a_1 = 200$
$a_8 = 25$

b) $$S_8 = \sum_{i=1}^{8} a_n = \frac{8(200+25)}{2}$$

$$= 4(225) = 900$$

The total amount of prize money awarded at the competition is \$900.

Pg 624

(119) let P_n = salary paid ($) during the n^{th} year

$$P_n = 30000(1.05)^{n-1}$$

$$S_{40} = \sum_{n=1}^{40} P_n = \frac{30000(1-1.05^{40})}{1-1.05}$$

$$= 3623993.23$$

The total compensation over the 40-year period is $3,623,993.23.