

**Math 105 TOPICS IN MATHEMATICS**  
**SOLUTION FOR REGULAR HOMEWORK – III (02/02)**

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**Line #:** 52920.

[I] (8pts) (1) Substitution of  $n = 20$  in  $n + 5$  yields

$$20 + 5 = 25.$$

(2) Substitution of  $n = 4$  in  $\frac{1}{2}n(n+1)$  yields

$$\frac{1}{2} \cdot 4 \cdot 5 = 10.$$

[II] (6pts) (1) Shifting  $n \mapsto n + 1$  in  $n + 7$  yields

$$(n+1) + 7 = n + 8.$$

(2) Shifting  $n \mapsto n + 1$  in  $\frac{1}{6}n(n+1)(n+2)$  yields

$$\frac{1}{6}(n+1)(n+2)(n+3).$$

[III] (8pts)

(a) The fourth spot from the left in row 8 in the Pascal is 56.

(b) The sixth spot from the left in row 10 in the Pascal is 252.

[IV] (8pts)

(a) The fifth spot from the left in row 16 in the Pascal, in a fraction form, is

$$\frac{13 \cdot 14 \cdot 15 \cdot 16}{1 \cdot 2 \cdot 3 \cdot 4} \cdot$$

(b) The tenth spot from the left in row 100 in the Pascal, in a fraction form, is

$$\frac{92 \cdot 93 \cdot 94 \cdot 95 \cdot 96 \cdot 97 \cdot 98 \cdot 99 \cdot 100}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot 9} \cdot$$