

Lesson 8.5 Math Lab: Assess Your Understanding, page 737

1. These are the numbers in row 10 of Pascal's triangle. Use these numbers to generate the numbers in row 11.

1 9 36 84 126 126 84 36 9 1

 $1 + 9 = 10$ $9 + 36 = 45$ $36 + 84 = 120$ $84 + 126 = 210$

$126 + 126 = 252$ $126 + 84 = 210$ $84 + 36 = 120$

$36 + 9 = 45$ $9 + 1 = 10$ 1

So, the numbers in row 11 are: 1, 10, 45, 120, 210, 252, 210, 120, 45, 10, 1

2. Use the completed Pascal's triangle on page 735 to evaluate each expression. Use a calculator to verify your answers.

a) ${}_4C_1$

 2nd number in row 5 is 4.

${}_4C_1 = 4$

b) ${}_7C_2$

 3rd number in row 8 is 21.

${}_7C_2 = 21$

c) ${}_6C_3$

 4th number in row 7 is 20.

${}_6C_3 = 20$

d) ${}_5C_0$

 1st number in row 6 is 1.

${}_5C_0 = 1$

3. Use combinations to determine the numbers in row 13 of Pascal's triangle.

 Use ${}_{12}C_r$ and a calculator.

${}_{12}C_0 = 1$, ${}_{12}C_1 = 12$, ${}_{12}C_2 = 66$, ${}_{12}C_3 = 220$,

${}_{12}C_4 = 495$, ${}_{12}C_5 = 792$, ${}_{12}C_6 = 924$, ${}_{12}C_7 = 792$,

${}_{12}C_8 = 495$, ${}_{12}C_9 = 220$, ${}_{12}C_{10} = 66$, ${}_{12}C_{11} = 12$, ${}_{12}C_{12} = 1$

So, the numbers in row 13 are:

1, 12, 66, 220, 495, 792, 924, 792, 495, 220, 66, 12, 1

4. Determine the value of each number in Pascal's triangle.

- a) the second number in row 20

 $n = 19$ and $r = 1$ ${}_{19}C_1 = 19$

- b) the fourth number in row 24

 $n = 23$ and $r = 3$ ${}_{23}C_3 = 1771$