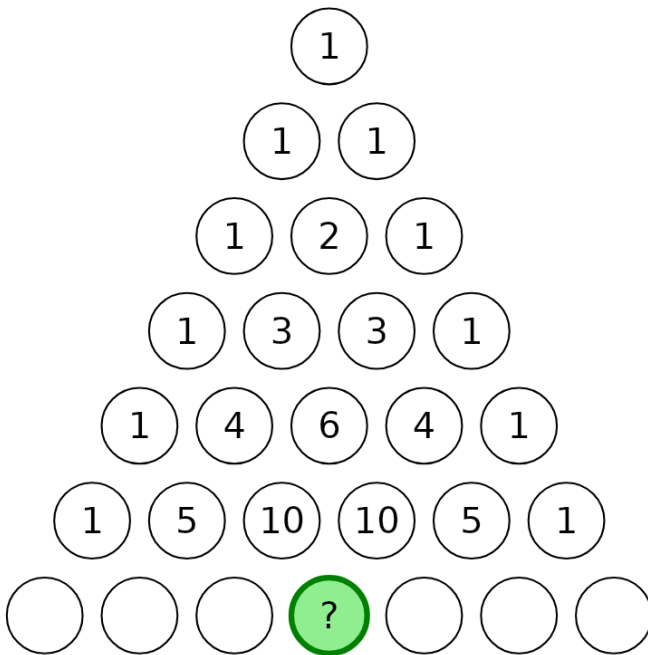


Probability and Statistics - Binomial Theorem and Pascal's Triangle - Intro

- 1 Each entry in Pascal's triangle is the sum of the two entries directly above it. Find the value of the highlighted entry in the next row.



A

19

B

21

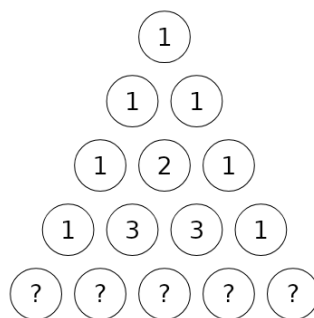
C

20

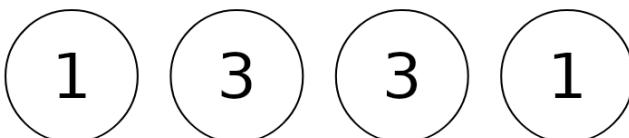
D

10

- 2 Each entry in Pascal's triangle is the sum of the two entries directly above it. Find the complete next row.



A



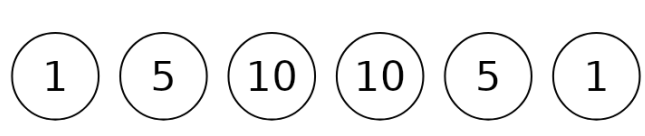
B

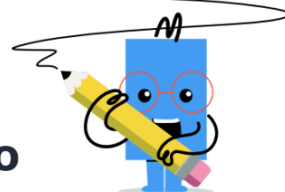


C



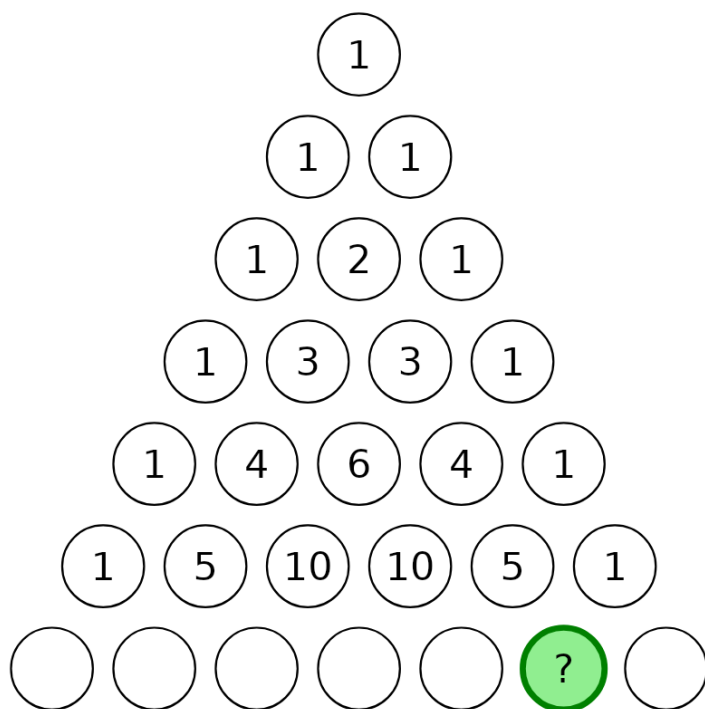
D





Probability and Statistics - Binomial Theorem and Pascal's Triangle - Intro

3 Find the value of the highlighted entry in the next row of Pascal's triangle.



A

7

B

5

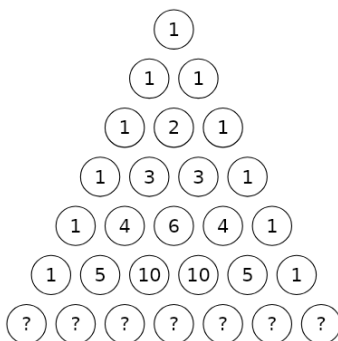
C

6

D

1

4 Find the complete next row of Pascal's triangle.



A

1	6	15	20	15	6	1
---	---	----	----	----	---	---

B

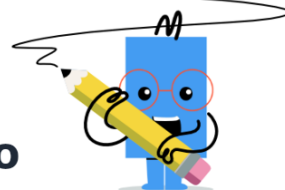
6	1	15	20	15	6	1
---	---	----	----	----	---	---

C

1	7	21	35	35	21	7	1
---	---	----	----	----	----	---	---

D

1	5	10	10	5	1
---	---	----	----	---	---



Probability and Statistics - Binomial Theorem and Pascal's Triangle - Intro

- 5** In Pascal's triangle (counting from 0), which row contains this entry?

$$\{5\choose 3\}$$

$$\binom{5}{3}$$

A	Row 4	B	Row 3
C	Row 6	D	Row 5

- 6** In Pascal's triangle (counting from 0), which column contains this entry?

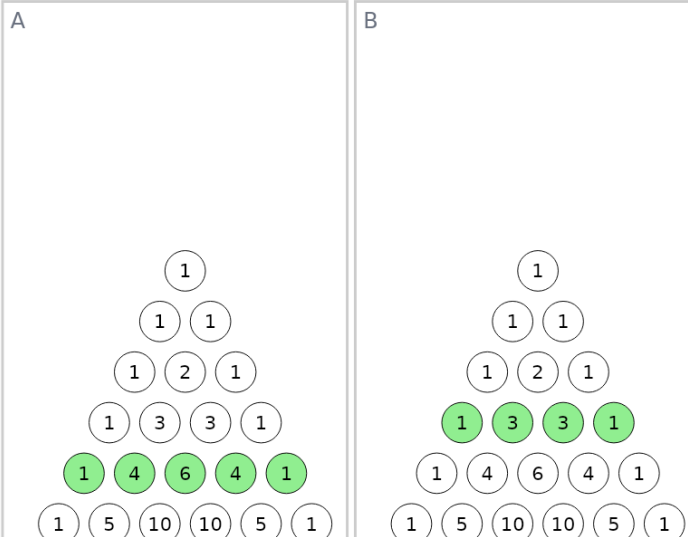
$$\{4\choose 2\}$$

$$\binom{4}{2}$$

A	Column 4	B	Column 2
C	Column 3	D	Column 1

- 7** Select the Pascal's triangle with the row for this entry highlighted (counting from 0). $\{4\choose 3\}$

$$\binom{4}{3}$$



- 8** Find the term containing t^1 in the expansion of this expression.
- $$\begin{array}{c} (t+n)^5 \\ \sum_{k=0}^5 \binom{5}{k} t^{5-k} n^k \end{array}$$

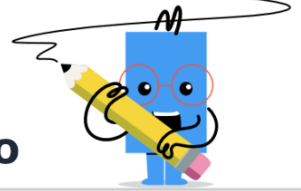
A	$\binom{5}{4} t^4 n^1$	B	$\binom{5}{4} t^1 n^4$
C	$\binom{4}{5} t^1 n^4$	D	$\binom{5}{5} t^0 n^5$

- 9** Find the term containing m^1 in the expansion of this expression.
- $$\begin{array}{c} (m+p)^5 \\ \sum_{k=0}^5 \binom{5}{k} m^{5-k} p^k \end{array}$$

A	1	B	5
C	10		



Probability and Statistics - Binomial Theorem and Pascal's Triangle - Intro



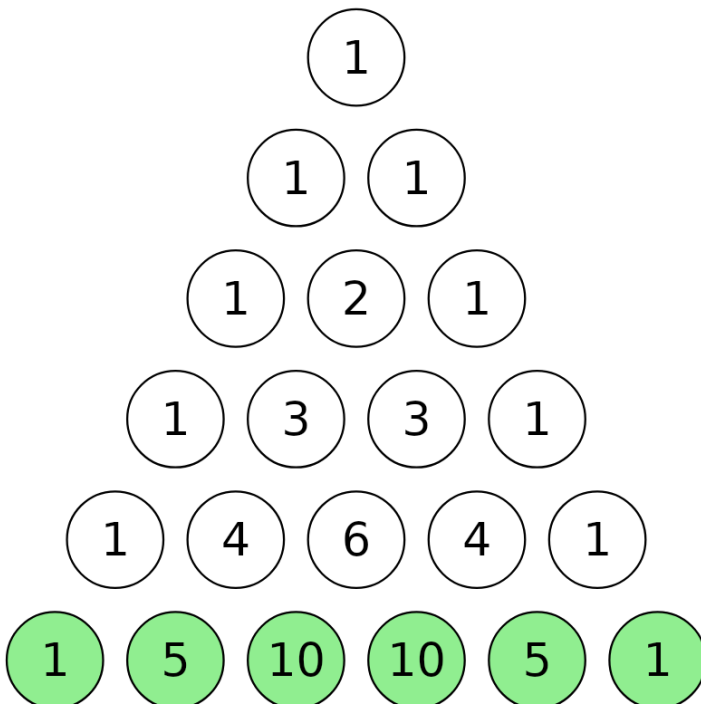
- 10** Select the Pascal's triangle with the column for this entry highlighted (counting from 0).
 $\{4 \setminus \text{choose } 1\}$

$$\binom{4}{1}$$

A

B

- 11** Which binomial notation matches the highlighted row (counting from 0)?



A

$$\binom{6}{3}$$

B

$$\binom{3}{5}$$

C

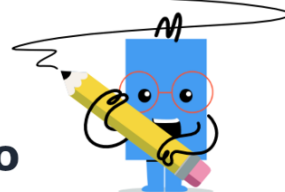
$$\binom{5}{3}$$

D

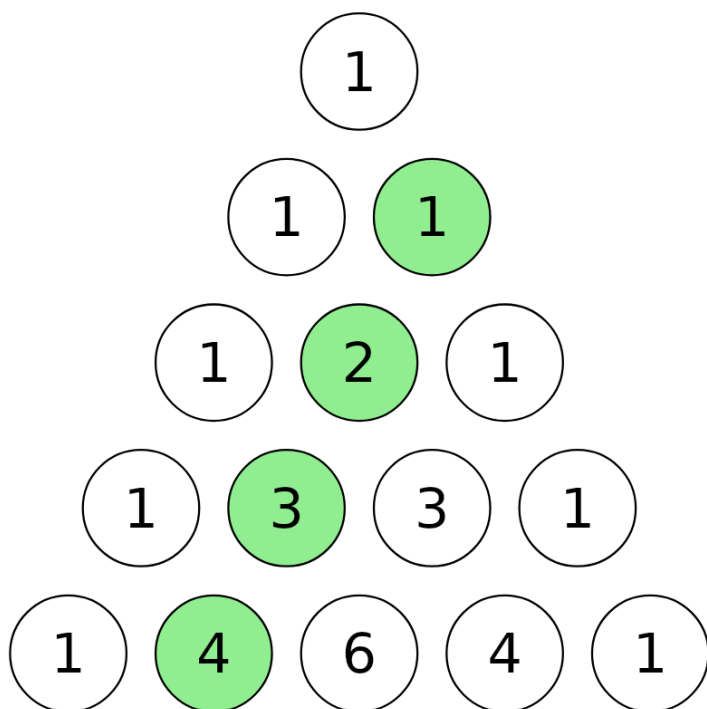
$$\binom{4}{3}$$



Probability and Statistics - Binomial Theorem and Pascal's Triangle - Intro



12 Which binomial notation matches the highlighted column (counting from 0)?



A

$$\binom{1}{4}$$

B

$$\binom{4}{1}$$

C

$$\binom{4}{0}$$

D

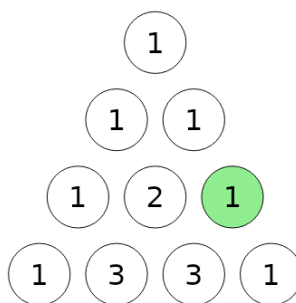
$$\binom{4}{2}$$

13 Select the Pascal's triangle with the entry for this binomial notation highlighted.

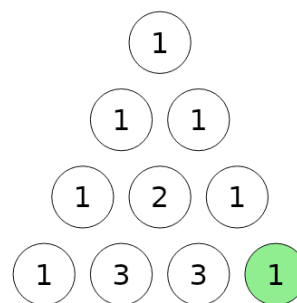
$\{3\choose 2\}$

$$\binom{3}{2}$$

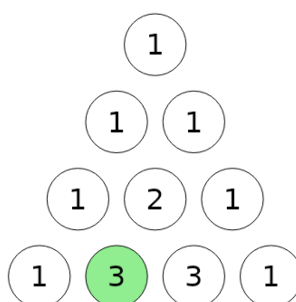
A



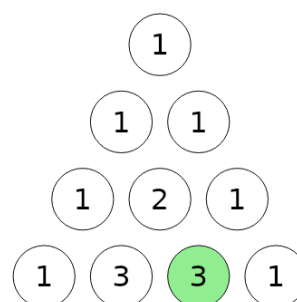
B

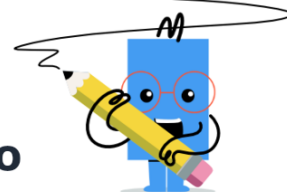


C



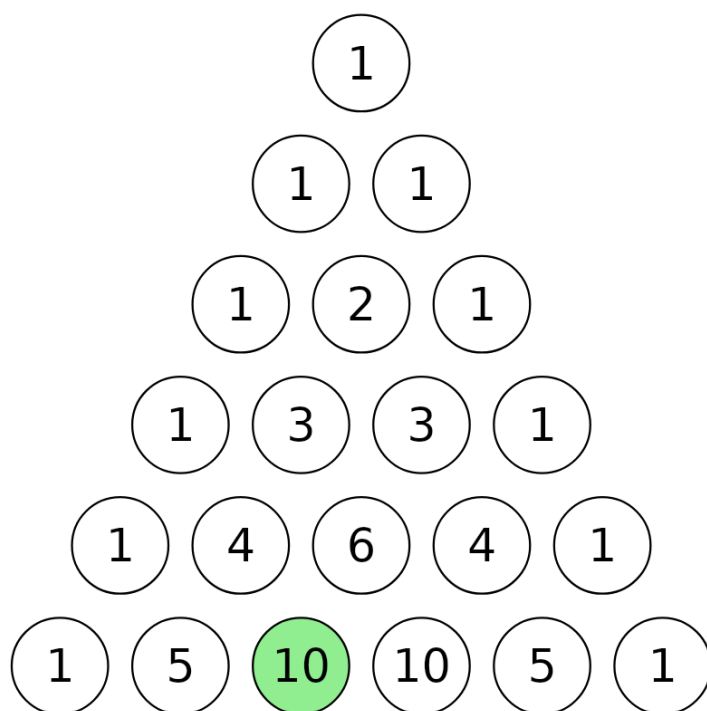
D





Probability and Statistics - Binomial Theorem and Pascal's Triangle - Intro

14 Which binomial notation matches the highlighted entry of Pascal's triangle?



A

$$\binom{5}{2}$$

B

$$\binom{2}{5}$$

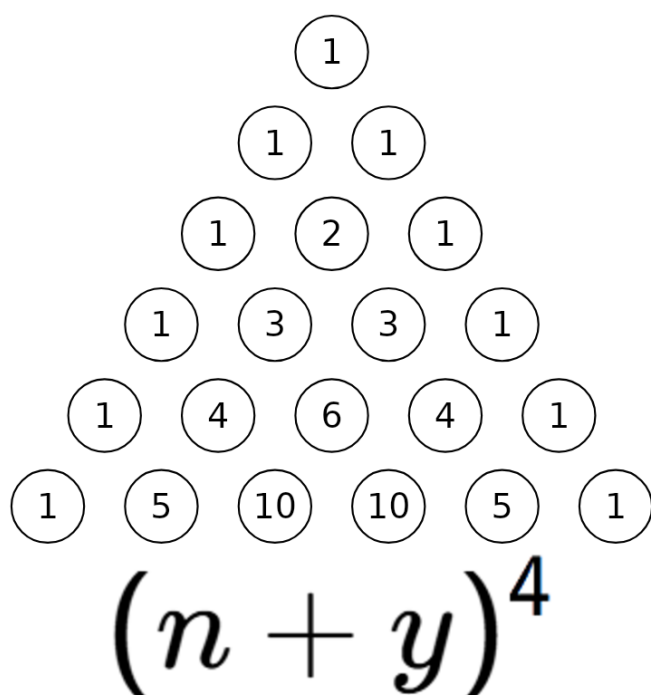
C

$$\binom{5}{3}$$

D

$$\binom{5}{1}$$

15 Use Pascal's triangle to expand this expression.



A

$$n^4 + 4n^3y + 6n^2y^2 + 4ny^3 + y^4$$

B

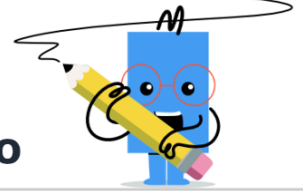
$$n^4 + 3n^3y + 3n^2y^2 + ny^3$$

C

$$y^4 + 4ny^3 + 6n^2y^2 + 4n^3y + n^4$$

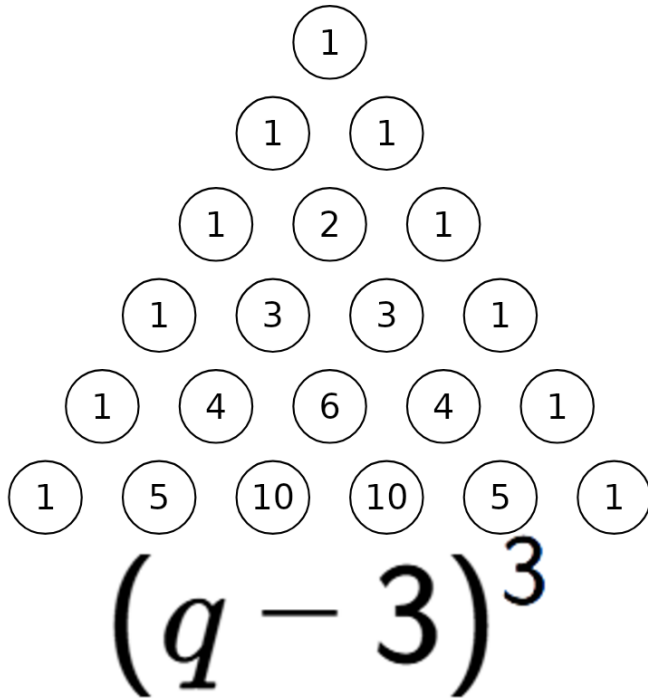
D

$$n^4 + 5n^3y + 10n^2y^2 + 10ny^3 + 5y^4$$



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16 Use Pascal's triangle to write the partly-expanded form (leave each power un-evaluated).



A

$$1q^3 + 3 \cdot (-3)^1 q^2 + 3 \cdot (-3)^2 q + 1 \cdot (-3)^3$$

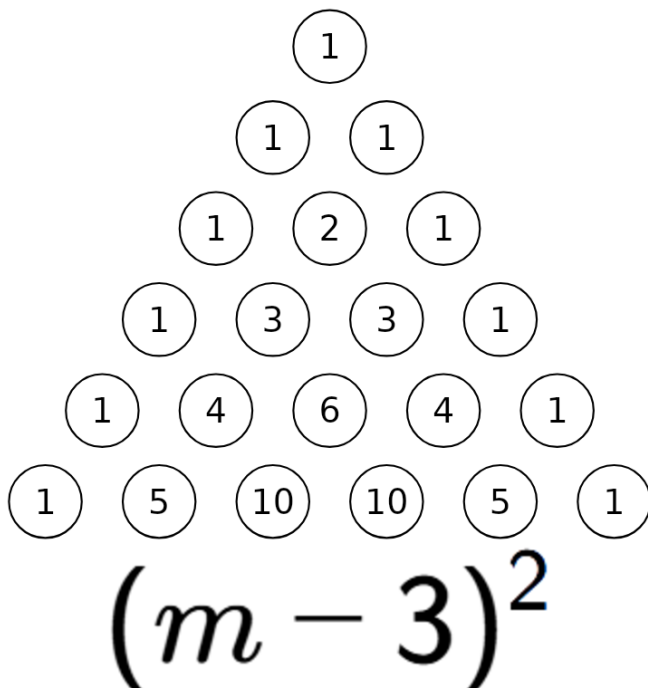
B

$$1q^3 + 2 \cdot (-3)^1 q^2 + 1 \cdot (-3)^2 q + 0 \cdot (-3)^3$$

C

$$1q^3 + 4 \cdot (-3)^1 q^2 + 6 \cdot (-3)^2 q + 4 \cdot (-3)^3$$

17 Use Pascal's triangle to fully expand this expression.



A

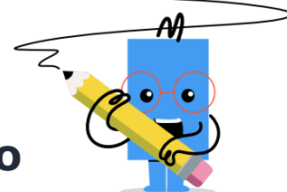
$$-6m - 6$$

B

$$m^2 - 3m$$

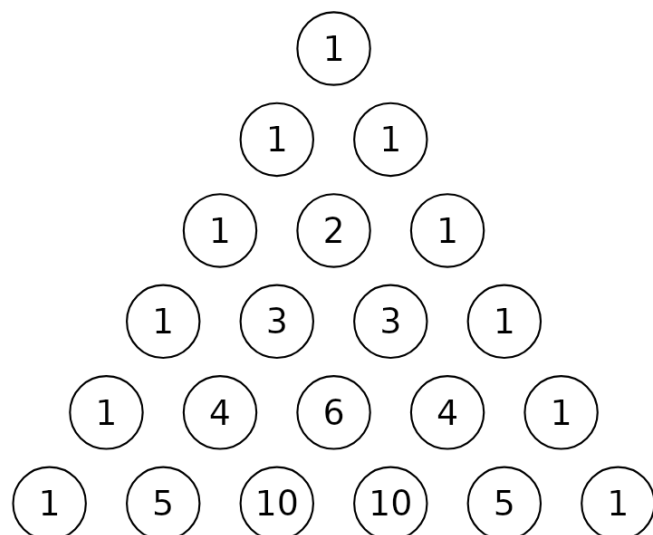
C

$$m^2 - 6m + 9$$



Probability and Statistics - Binomial Theorem and Pascal's Triangle - Intro

18 Use Pascal's triangle to write the partly-expanded form (leave each power un-evaluated).



$$(-3z - 3)^2$$

A

$$1 \cdot (-3)^2 z^2 + 1 \cdot (-3)^1 \cdot (-3)^1 z + 0 \cdot (-3)^2$$

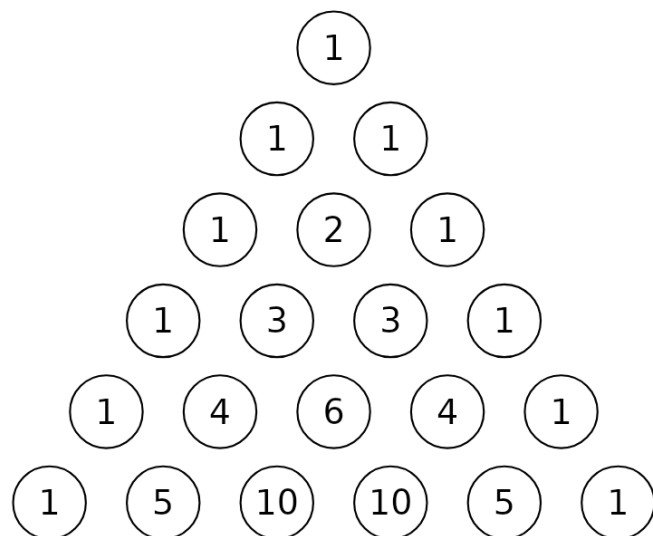
B

$$1 \cdot (-3)^2 z^2 + 3 \cdot (-3)^1 \cdot (-3)^1 z + 3 \cdot (-3)^2$$

C

$$1 \cdot (-3)^2 z^2 + 2 \cdot (-3)^1 \cdot (-3)^1 z + 1 \cdot (-3)^2$$

19 Use Pascal's triangle to fully expand this expression.



$$(-3x - 3)^3$$

A

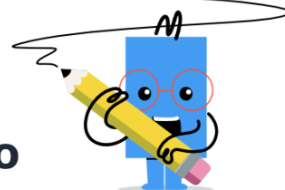
$$-81x^2 + 54x - 9$$

B

$$-27x^3 - 54x^2 - 27x$$

C

$$-27x^3 - 81x^2 - 81x - 27$$



Probability and Statistics - Binomial Theorem and Pascal's Triangle - Intro

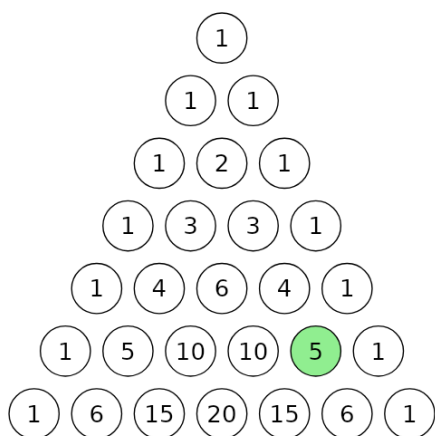
- 20** Using Pascal's triangle, find the binomial coefficient for the term containing x^1 in the expansion of this expression. Select the coefficient (the triangle entry), not the full term.

$$(x+y)^5 = \sum_{k=0}^5 {}^5C_k x^{5-k} y^k$$

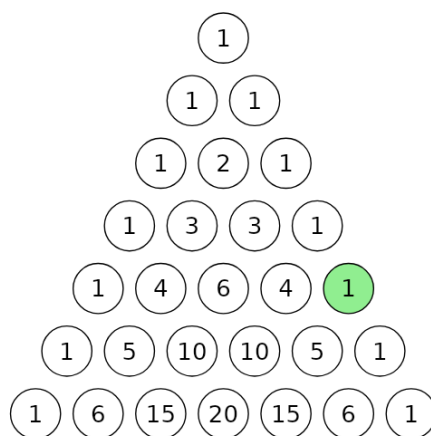
$$(x+y)^5$$

$$(x+y)^5 = \sum_{k=0}^5 {}^5C_k x^{5-k} y^k$$

A



B



- 21** Find the term containing q^3 in the expansion of this expression.

$$(q+2)^5 = \sum_{k=0}^5 {}^5C_k q^{5-k} 2^k$$

$$(q+2)^5$$

$$(q+2)^5 = \sum_{k=0}^5 {}^5C_k q^{5-k} 2^k$$

A

$${}^2C_5 q^3 (2)^2$$

B

$${}^5C_2 q^3 (2)^3$$

C

$${}^5C_2 q^2 (2)^3$$

D

$${}^5C_2 q^3 (2)^2$$

- 22** Find the term containing x^1 in the expansion of this expression.

$$(x-3)^4 = \sum_{k=0}^4 {}^4C_k x^{4-k} (-3)^k$$

$$(x-3)^4$$

$$(x-3)^4 = \sum_{k=0}^4 {}^4C_k x^{4-k} (-3)^k$$

A

$${}^4C_4 x^0 \cdot 81$$

B

$${}^4C_3 x^1 \cdot -27$$

C

$${}^4C_3 x^1 \cdot -9$$

- 23** Find the term containing t^2 in the expansion of this expression.

$$(t-2)^3 = \sum_{k=0}^3 {}^3C_k t^{3-k} (-2)^k$$

$$(t-2)^3$$

$$(t-2)^3 = \sum_{k=0}^3 {}^3C_k t^{3-k} (-2)^k$$

A

12

B

-6

C

6

- 24** In Pascal's triangle (counting from 0), which row contains this entry?

$3C_1$

$3C_1$

A

Row 2

B

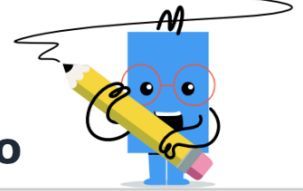
Row 1

C

Row 4

D

Row 3



Probability and Statistics - Binomial Theorem and Pascal's Triangle - Intro

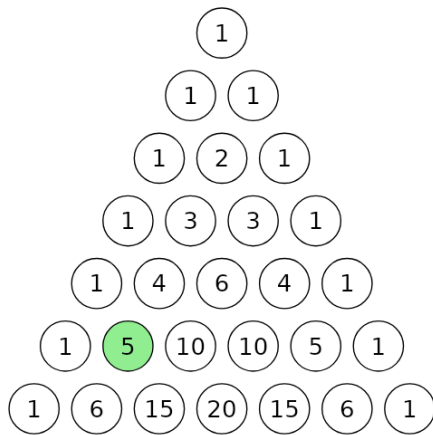
- 25** Using Pascal's triangle, find the binomial coefficient for the term containing y^4 in the expansion of this expression. Select the coefficient (the triangle entry), not the full term.

$$(y+2)^5 = \sum_{k=0}^5 {}^5C_k y^{5-k} 2^k$$

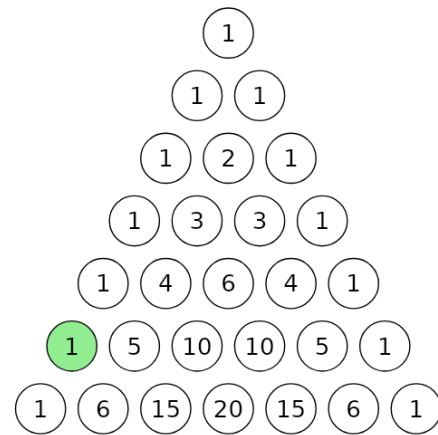
$$(y+2)^5$$

$$(y+2)^5 = \sum_{k=0}^5 {}^5C_k y^{5-k} 2^k$$

A



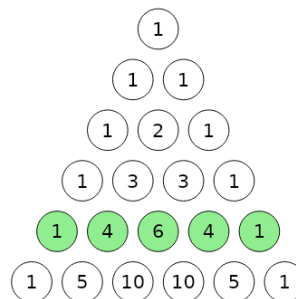
B



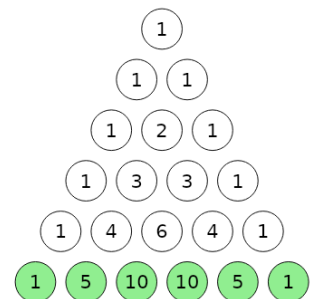
- 26** Select the Pascal's triangle with the row for this entry highlighted (counting from 0).

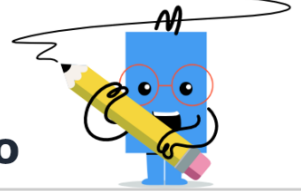
$4C_3$

A



B





Probability and Statistics - Binomial Theorem and Pascal's Triangle - Intro

- 27** In Pascal's triangle (counting from 0), which column contains this entry?

$5C_2$

$5C_2$

A Column 3	B Column 1
C Column 2	D Column 5

- 28** Select the Pascal's triangle with the column for this entry highlighted (counting from 0).

$3C_1$

$3C_1$

A	B