

Name:

Result:

1.

Simplify $\binom{n}{n-2}$ and hence solve:

(2 points)

$$\binom{n}{n-2} = 21$$

where $n \in \mathbb{N}$, $n > 2$.

2.

(2 points)

(a) Tomasz needs to choose 4 students out of his class of 12 to represent the group at a maths competition. Find the number of possible selections.

(b) Out of the remaining 8 students Tomasz will pick 3 to solve 3 different maths problems on the board (1 problem each). In how many ways can it be done?

3.*(4 points)*

The coefficient of x^3 in the expansion of $\left(2x - \frac{a}{x^2}\right)^{12}$ is equal to -3041280 .

- (a) Calculate the value of a .
- (b) Find the constant term of the expansion.

4.*(4 points)*

Consider the expansion of $(1 + 5x + 6x^2)^7$ written in ascending powers of x :

$$(1 + 5x + 6x^2)^7 = 1 + ax + b^2x + \dots + 279936x^{14}$$

Find the values of a and b .