

Binomial Expansion

(a) Expand and simplify $(x + 2)^3$

| Pascal's Triangle | Powers of 1 st term | Powers of 2 nd term | Simplified |
|-------------------|--------------------------------|--------------------------------|------------|
| 1 | x^3 | 2^0 | x^3 |
| 3 | x^2 | 2^1 | $6x^2$ |
| 3 | x^1 | 2^2 | |
| 1 | x^0 | 2^3 | |

$$= x^3 + 6x^2 +$$

(b) Expand and simplify $(x - 5)^3$

| Pascal's Triangle | Powers of 1 st term | Powers of 2 nd term | Simplified |
|-------------------|--------------------------------|--------------------------------|------------|
| 1 | x^3 | $(-5)^0$ | x^3 |
| 3 | x^2 | $(-5)^1$ | $-15x^2$ |
| | | | |
| | | | |

$$= x^3 - 15x^2 +$$

(c) Expand and simplify $(x + y)^4$

| Pascal's Triangle | Powers of 1 st term | Powers of 2 nd term | Simplified |
|-------------------|--------------------------------|--------------------------------|------------|
| 1 | x^4 | y^0 | |
| 4 | x^3 | y^1 | |
| 6 | x^2 | y^2 | |
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(d) Expand and simplify $(2x + 1)^4$

| Pascal's Triangle | Powers of 1 st term | Powers of 2 nd term | Simplified |
|-------------------|--------------------------------|--------------------------------|------------|
| 1 | $(2x)^4$ | 1^0 | $16x^4$ |
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(e) Expand and simplify $(3x - 2)^5$

| Pascal's Triangle | Powers of 1 st term | Powers of 2 nd term | Simplified |
|-------------------|--------------------------------|--------------------------------|------------|
| 1 | $(3x)^5$ | $(-2)^0$ | |
| 5 | $(3x)^4$ | $(-2)^1$ | |
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(f) Expand and simplify $(4 - y)^5$

| Pascal's Triangle | Powers of 1 st term | Powers of 2 nd term | Simplified |
|-------------------|--------------------------------|--------------------------------|------------|
| 1 | 4^5 | $(-y)^0$ | |
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