

Binomial theorem exercise answer

June 2021

Answer

- 1 (a) $a^3 + 3a^2b + 3ab^2 + a^3$
(b) $243x^4 - 1620x^4 + 4320x^3 - 5760x^2 + 3840x - 1024$
(c) $625x^{12} - 500x^9y^2 + 150x^6y^4 - 20x^3y^6 + y^8$
(d) $16x^4 - 32x^2 + 24 - \frac{8}{x^2} + \frac{1}{x^4}$
- 2 (a) $243 - 162x - 54x^2 + 72x^3 + \dots$
(b) $64 - 192x + 432x^2 - 640x^3 + \dots$
- 3 (a) 104060401
(b) 941192
- 4 (a) ≈ 1.062
(b) ≈ 15.37
- 5 (a) $1 - 12x + 78x^2 - 340x^3 + \dots$
(b) $x = \frac{1}{100}$ or $x = \frac{197}{300}$
(c) Put $x = \frac{1}{100}$ into $1 - 12x + 78x^2 - 340x^3$:
 0.9803^6
 ≈ 0.88746
- 6 (a) -319472
(b) 2288
(c) The constant term is 0.
- 7 (a) 781250
(b) -121
(c) 125650

8 (a) $n = 4$

(b) 48

9 (a) $b^n + nab^{n-1}x + \frac{n(n-1)}{2}a^2b^{n-2}x^2 + \frac{n(n-1)(n-2)}{6}a^3b^{n-3}x^3 + \dots$

(b) $\begin{cases} a=2 \\ b=-1 \\ n=5 \end{cases}$

10 -

11 -

12 (a) -

(b) -