BINOMIAL EXPANSION APPROXIMATIONS

1	2	3	4	5

(a) Use the 1st 3 terms of the expansion of $(3-2x)^7$ to approximate 2.8^7

(b) Explain why the expansion $(1+x)^{15} \approx 1+15x+105x^2+455x^3$ can't be used to estimate 2.01^{15}

(c) Use $x=\frac{1}{10}$ in $(1-2x)^{-\frac{1}{2}} \approx 1+x+\frac{3}{2}x^2+\frac{5}{2}x^3$ to approximate $\sqrt{5}$

(a)

(b)

(c)

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LEVEL 1

$(\ldots)^n = \ldots^n$

- put here equal
- find x
- check x is small enough
- use x in expansion.

LEVEL 2

choosing an expansion

$2.99^4 = (1+x)^4$

$x = 1.99$

$2.994^4 = (3-x)^4$

$x = 0.01$

LEVEL 3

find a related approximation

$2.99^4 = (10 \times 0.299)^4$

$= 10^4 \times 0.299^4$

$1+x = 0.299$

$x = 0.701$ ☺