

## Solutions

---

Each answer shows the steps, then the **result**.

### 2.1

- $(1+x)^{-1} = 1 - x + x^2 - \dots$

### 2.2

- $5 = A(x+4) + B(x-1); x=1 \Rightarrow A=1; x=-4 \Rightarrow B=-1; \frac{1}{x-1} - \frac{1}{x+4}$

### 3.1 A

- $(1+2x)^{1/2} = 1 + \frac{1}{2}(2x) + \frac{(1/2)(-1/2)}{2}(2x)^2 + \dots = 1 + x - \frac{1}{2}x^2 + \dots$

### 3.2

- $9x+5 = A(2x-1) + B(x+1); x=-1 \Rightarrow -4 = -3A \Rightarrow A = \frac{4}{3}; x = \frac{1}{2} \Rightarrow 9.5 = 1.5B \Rightarrow B = \frac{19}{3}; \frac{4}{3(x+1)} + \frac{19}{3(2x-1)}$

### 3.3

(a)

- $2 = A(1+2x) + B(1-x); x=1 \Rightarrow A = \frac{2}{3}; x = -\frac{1}{2} \Rightarrow B = \frac{4}{3}; \frac{2/3}{1-x} + \frac{4/3}{1+2x}$

(b)

- $\frac{2}{3}(1+x+x^2) + \frac{4}{3}(1-2x+4x^2); = \frac{2}{3} + \frac{4}{3} + (\frac{2}{3} - \frac{8}{3})x + (\frac{2}{3} + \frac{16}{3})x^2; = 2 - 2x + 6x^2$