MORE ALGEBRA TRICKS

$$(-1)^{n+2} = (-1)^n \equiv (-1)^n (-1)^2 = (-1)^{n+2}$$

$$(-1)^{n-1} = (-1)^{n+1} = (-1)^{n-1}(-1)^2 = (-1)^{n+1}$$

$$\frac{1}{(-1)} = \frac{(-1)}{1} = (-1)$$

$$(-1)^{2n} = 1 = \left[(-1)^2\right]^n$$

$$(-1)^{2n+1} = -1 = (-1)^{2n}(-1)$$

$$(\sqrt{3})^{2n+1} = (\sqrt{3})(\sqrt{3})^{2n} = \sqrt{3}\left((\sqrt{3})^2\right)^n = \sqrt{3}\,(3^n)$$

$$(\sqrt{3})^{2n+1} = (\sqrt{3})(3^n)$$

$$\frac{1}{x-9} = \frac{1}{(-1)(9-x)} = \frac{-1}{9-x} = \frac{-1}{9\left(1-\frac{x}{9}\right)}$$

$$\frac{1}{x-9} = \left(\frac{-1}{9}\right)\left(\frac{1}{\left(1-\frac{x}{9}\right)}\right) = \left(\frac{-1}{9}\right)\left(\sum_{n=0}^{\infty}\left(\frac{x}{9}\right)^n\right)$$

$$= \sum_{n=0}^{\infty} (-1) \cdot \frac{x^n}{9^{n+1}}$$