

$$4 \cos\left(\frac{x}{7}\right)$$

$$\frac{d}{dx} \cos\left(\frac{x}{7}\right)$$

$$\frac{d}{dx} \cos\left(\frac{x}{7}\right) = -\sin\left(\frac{x}{7}\right) \frac{1}{7}$$

$$\frac{d^2}{dx^2} \cos\left(\frac{x}{7}\right) = \frac{-1}{49} \cos\left(\frac{x}{7}\right)$$

$$\frac{d^3}{dx^3} \cos\left(\frac{x}{7}\right) = \frac{1}{343} \sin\left(\frac{x}{7}\right)$$

$$\frac{d^4}{dx^4} \cos\left(\frac{x}{7}\right)$$

$$5 \quad f(x) = \frac{1}{\sqrt[4]{1+4x^3}}$$

$$\sum_{n=0}^{\infty} \binom{r}{n} \frac{x^n}{n!}$$

$$\frac{1}{\sqrt[4]{1+4x^3}}$$

$$(1+x)^r$$

$$= 1 + rx + \frac{r(r-1)}{2}x^2 + \dots + \frac{r(r-1)(r-n+1)}{n!}x^n$$

$$= (1+4x^3)^{-1/4}$$

$$r = -1/4$$

$$x = 4x^3$$

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

$$= 1 - x^3 + \frac{5x^6}{2} - \frac{45x^9}{6}$$

6 $\ln(1+x^3)$

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

$x = x^3$

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

$$= x^3 - \frac{x^6}{2} + \frac{x^9}{3} - \frac{x^{12}}{4}$$

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$$f(x) = \frac{3x^8}{1+x^6}$$

$$\sum_{n=0}^{\infty} a_n x^n$$

$$= \underline{\underline{3(-1)^n x^{6n+8}}}$$

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$$\frac{\sin(2x)}{\sin(\frac{4\pi}{3})}$$

=

$$\frac{\sin(\frac{4\pi}{3}) + \cancel{\sin} \cos(\frac{4\pi}{3})}{2} = \frac{4\sin(\frac{4\pi}{3})}{6}$$

$$\frac{\sin(\frac{4\pi}{3}) + \cos(\frac{4\pi}{3})\cancel{\sin(\frac{4\pi}{3})}}{2} = \frac{2\sin(\frac{4\pi}{3})\cos(\frac{4\pi}{3})}{2}$$

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

$$x = 4x^2$$

$$(-1)^{4+1} 4x^2 = \frac{16x^4}{2} + \frac{64x^6}{3} + \frac{256x^8}{4}$$

$$-4x^2 - 8x^4 + \frac{64x^6}{3} - 64x^8$$

10 $\frac{1}{(1+\frac{2}{3}x)^3}$

$$= (1+\frac{2}{3}x)^{-3}$$

$$r = -3$$

$$x = \frac{2}{3}$$

$$1 + \left(\frac{-6}{x}\right) + \frac{(-3)(-3-1)}{2} \frac{4}{x^2} + \frac{(-3)(-3-3+1)}{2} \frac{8}{x^3}$$

$$1 - \frac{6}{x} + \frac{24}{x^2} + \frac{20}{x^3}$$

16 $\frac{1}{7x+5} = \frac{1}{1-x}$

$$= \frac{1}{5-(-7x)}$$

$$\frac{1}{5} \left(\frac{1}{1-(-7/5)x} \right)$$

$$r = -7/5x$$

$$a = \frac{1}{5}$$

ar^n

17.

$$\frac{d}{1-r}$$

$$\sum_{n=0}^{\infty} 2^n (-1)^n x^n$$

$$-14x^n$$

$$r = -14x$$

$$a = 1$$

$$= \frac{1}{1 + 14x}$$

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$$\sum_{n=0}^{\infty} \frac{f^{(n)}(a)}{n!} (x-a)^n$$

$$\frac{d}{dx} \sin(2x)$$

$$2 \cos(2x)$$

$$-4 \sin(2x)$$

$$\frac{d^2}{dx^2} \sin(2x)$$