

$$f := e^x$$

$$e^x \tag{1}$$

$s3 := \text{taylor}(f, x=0, 4)$ #Taylor polynomial about $x=0$ with 4 terms (that is, degree 3) with remainder

$$1 + x + \frac{1}{2} x^2 + \frac{1}{6} x^3 + O(x^4) \tag{2}$$

$p3 := \text{convert}(s3, \text{polynom})$ #Convert to polynomial by dropping remainder

$$1 + x + \frac{1}{2} x^2 + \frac{1}{6} x^3 \tag{3}$$

$s4 := \text{taylor}(f, x=0, 5)$

$$1 + x + \frac{1}{2} x^2 + \frac{1}{6} x^3 + \frac{1}{24} x^4 + O(x^5) \tag{4}$$

$s5 := \text{taylor}(f, x=0, 6)$

$$1 + x + \frac{1}{2} x^2 + \frac{1}{6} x^3 + \frac{1}{24} x^4 + \frac{1}{120} x^5 + O(x^6) \tag{5}$$

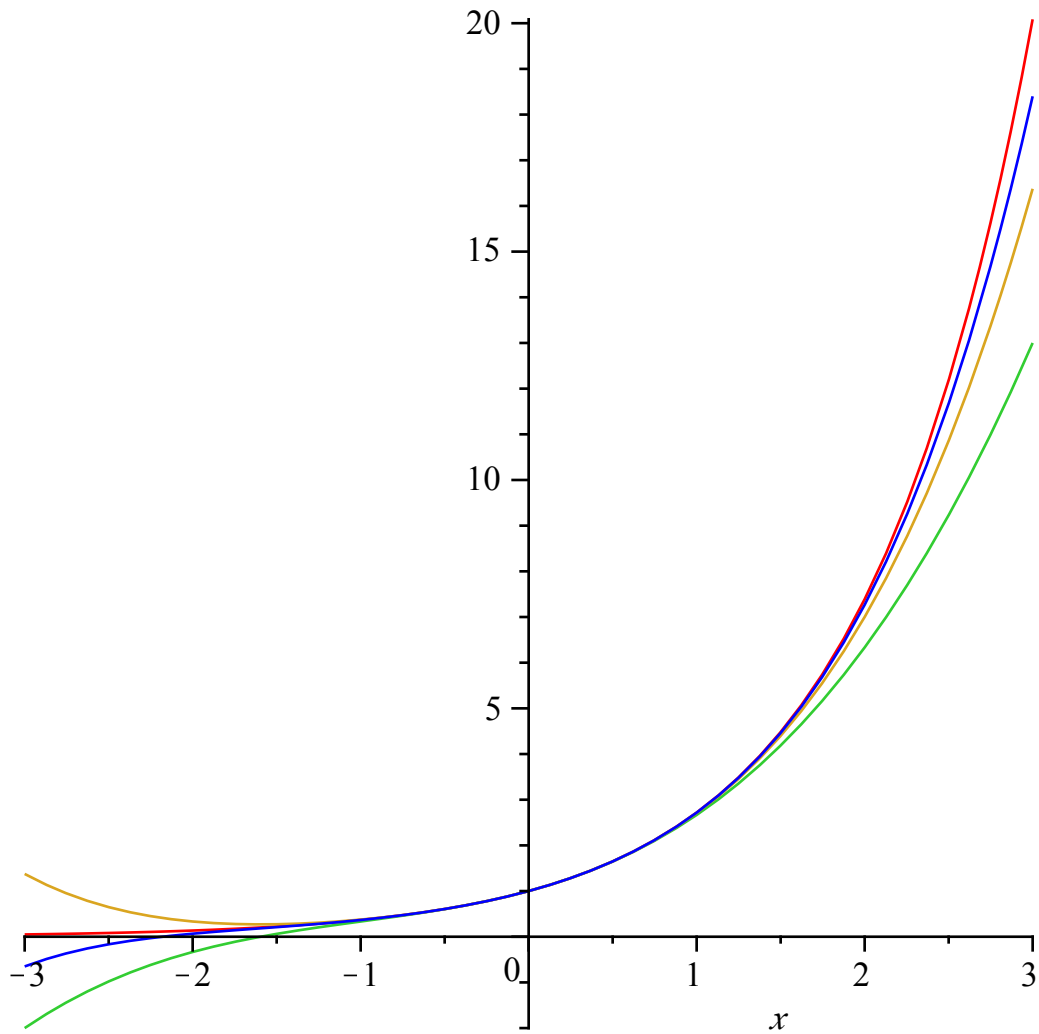
$p4 := \text{convert}(s4, \text{polynom})$

$$1 + x + \frac{1}{2} x^2 + \frac{1}{6} x^3 + \frac{1}{24} x^4 \tag{6}$$

$p5 := \text{convert}(s5, \text{polynom})$

$$1 + x + \frac{1}{2} x^2 + \frac{1}{6} x^3 + \frac{1}{24} x^4 + \frac{1}{120} x^5 \tag{7}$$

$\text{plot}([f, p3, p4, p5], x=-3..3)$



$$g := \cos(x^2)$$

$$\cos(x^2)$$

(8)

$$\int_0^{0.8} g \, dx$$

$$0.7678475376$$

(9)

$$t4 := \text{taylor}(g, x=0, 5)$$

$$1 - \frac{1}{2} x^4 + O(x^5)$$

(10)

$$q4 := \text{convert}(t4, \text{polynom})$$

$$1 - \frac{1}{2} x^4$$

(11)

$$\text{approximation} := \int_0^{0.8} q4 \, dx$$

$$0.7672320000$$

(12)

answer - approximation

0.0006155376

(13)