

Ken mei 12/7/22 Week #8

Group 6:

Function  $f(x) = \frac{1}{x^2}$ , center:  $a = 1$ ,  $T_9(x) = ?$

$$f(x) = \frac{1}{x^2} \text{ or } x^{-2}$$

$$f'(x) = -2x^{-3} = -\frac{2}{x^3}$$

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

$$f'''(x) = 6(-4x^{-4-1}) = -24x^{-5} = -\frac{24}{x^5}$$

$$f^{(4)}(x) = -24(-5x^{-5-1}) = 120x^{-6} = \frac{120}{x^6}$$

$$f^{(5)}(x) = 120(-6x^{-6-1}) = -720x^{-7} = -\frac{720}{x^7}$$

$$f^{(6)}(x) = -720(-7x^{-7-1}) = 5040x^{-8} = \frac{5040}{x^8}$$

$$f^{(7)}(x) = 5040(-8x^{-8-1}) = -40320x^{-9} = -\frac{40320}{x^9}$$

$$f^{(8)}(x) = -40320(-9x^{-9-1}) = 362880x^{-10} = \frac{362880}{x^{10}}$$

$$f^{(9)}(x) = 362880(-10x^{-10-1}) = -3628800x^{-11} = -\frac{3628800}{x^{11}}$$

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Week # 8

Group 6:

Function  $f(x) = \frac{1}{x^2}$ , center:  $a = 1$ ,  $T_9(x) = ?$

$$f(1) = \frac{1}{1^2} = 1$$

$$f^{(5)}(1) = \frac{-720}{1^7} = -720$$

$$f'(1) = \frac{-2}{1^3} = -2$$

$$f^{(6)}(1) = \frac{5040}{1^8} = 5040$$

$$f''(1) = \frac{6}{1^4} = 6$$

$$f^{(7)}(1) = \frac{-40320}{1^9} = -40320$$

$$f'''(1) = \frac{-24}{1^5} = -24$$

$$f^{(8)}(1) = \frac{362880}{1^{10}} = 362880$$

$$f^{(4)}(1) = \frac{120}{1^6} = 120$$

$$f^{(9)}(1) = \frac{-3628800}{1^{11}} = -3628800$$

$$T_9(x) = 1 - 2(x-1) + \frac{6(x-1)^2}{2!} - \frac{24(x-1)^3}{3!} + \frac{120(x-1)^4}{4!} - \frac{720(x-1)^5}{5!} + \frac{5040(x-1)^6}{6!} - \frac{40320(x-1)^7}{7!} + \frac{362880(x-1)^8}{8!} - \frac{3628800(x-1)^9}{9!}$$