

1.	If $f(x) = x^3 + 3x$ , approximate $f(2.01)$ using linearization centered at $x = 2$ .
2.	For the function $f$ , $f' = 2x + 1$ and $f(1) = 4$ . What is the approximation for $f(1.2)$ using the tangent line approximation centered at $x = 1$ ?
3.	Approximate $\sqrt{24.9} + (24.9)^2$ using linearization.
4.	Find an approximate value for $f(-3.9)$ on $f(x) = \sqrt{x^2 + 9}$ using linearization.
5.	Approximate using tangent line approximation: $\sqrt[4]{17}$
6.	Approximate using a tangent line approximation $(8.4)^{\frac{4}{3}}$ .
7.	Find $\frac{d^2y}{dx^2}$ for $y = \frac{x+1}{x-2}$ . Simplify.
8.	Find $f''(x)$ for $f(x) = x(x+2)^3$ . Simplify. (Hint: factor after taking the first derivative to make the second derivative a bit easier)
9.	Evaluate $f'(1)$ for $f(x) = x^{\frac{1}{3}} - x^2 + 4x$ using a calculator.
10.	Evaluate $f'\left(\frac{\pi}{4}\right)$ for $f(x) = \sin^2 x$ using a calculator.
11.	Evaluate $f'(2)$ for $f(x) = \frac{e^x}{x+2}$ using a calculator.

**Answers:**

1. 14.15	2. 4.6	3. 624.99
4. 4.92	5. 2.031	6. $\frac{256}{15}$
7. $\frac{d^2y}{dx^2} = \frac{6}{(x-2)^3}$	8. $f''(x) = 3(x+2)(3x+10)$	9. 2.333
10. 1		