An RMarkdown Template for Written Assignments

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Assignment #1 for MAT325

Problem 1.

Find the derivative of function $f(x) = \sqrt{x^2 + 1}$.

Solution: Using the power and chain rules, we have

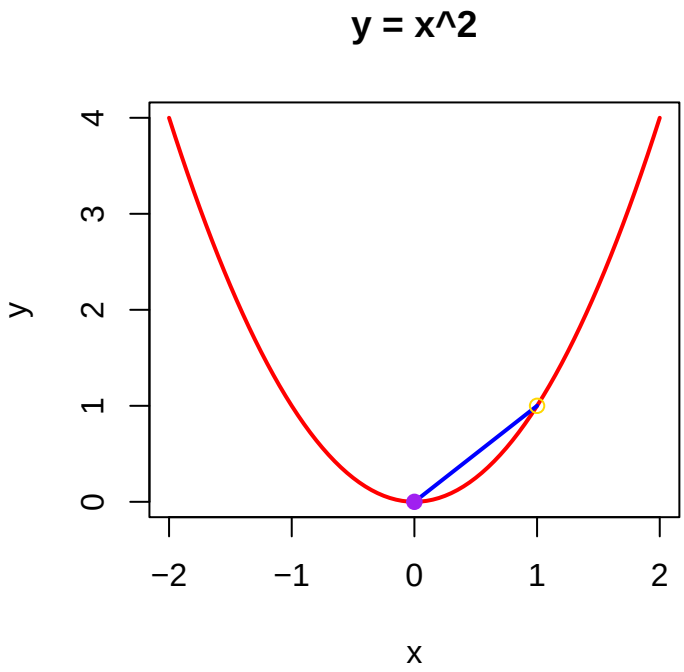
$$f'(x) = \left[(x^2+1)^{1/2}\right]' = \frac{1}{2}(x^2+1)^{1/2-1} \times (x^2+1)' = \frac{x}{\sqrt{x^2+1}}.$$

Problem 2.

Let $f(x) = x^2$. Draw a secant line that passes through points $P(0,0)$ and $Q(1,1)$.

Solution: We use the following R code to draw the secant line.

```
x=seq(-2,2,by=0.05)
y=x^2
plot(x, y, type = "l", main = "y = x^2", col = "red", lwd = 2)
segments(0,0,1,1, lwd=2, col="blue")
points(0,0, pch=19, col = "purple")
points(1,1, pch = 21, col = "gold")
```


y = x^2
y
0
1
2
3
4
−2
−1
0
1
2
x