

Math 229 Quiz 9a

You may use only Julia or `math229.github.io` – no other websites.

NAME: Solutions

Problem 1. Use the built-in `newton` function to find all zeros of $f(x) = \sqrt{x+4} \cos(x)$ for $0 \leq x \leq 10$.

- Write all the necessary Julia commands to do this.
- Write the answers, accurate to five decimal places.

1.57080
4.71239
7.85398

Julia commands:

```
f(x) = sqrt(x+4) * cos(x)
plot(f, 0, 10)
newton(f, 2)
5
8
```

Problem 2. Let $f(x) = e^{(x/3)} \sin(x+1)$ for $0 \leq x \leq 10$. Write both the Julia commands and your answers, accurate to five decimal places.

- Use `fzeros` to find all critical points of $f(x)$; i.e. points where $f'(x) = 0$.

0.89255
4.03414
7.17573

- Use `fzeros` to find all inflection points of $f(x)$; i.e. points where $f''(x) = 0$.

2.78509
5.92668
9.06828

Julia commands:

```
g(x) = exp(x/3) * sin(x+1)
plot(g, 0, 10)
fzeros(g', 0, 10)
fzeros(g'', 0, 10)
```

Math 229 Quiz 9b

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NAME: Solutions

Problem 1. Use the built-in `newton` function to find all zeros of $f(x) = \sqrt{x+3} \cos(x)$ for $0 \leq x \leq 10$.

- Write all the necessary Julia commands to do this.
- Write the answers, accurate to five decimal places.

1.57080
4.71239
7.85398

Julia commands:

```
f(x) = sqrt(x+3) * cos(x)
plot(f, 0, 10)
newton(f, 2)
5
8
```

Problem 2. Let $f(x) = e^{(x/5)} \sin(x+1)$ for $0 \leq x \leq 10$. Write both the Julia commands and your answers, accurate to five decimal places.

- Use `fzeros` to find all critical points of $f(x)$; i.e. points where $f'(x) = 0$.

0.76819
3.90978
7.05138

- Use `fzeros` to find all inflection points of $f(x)$; i.e. points where $f''(x) = 0$.

2.53638
5.67798
8.81957

Julia commands:

```
g(x) = exp(x/5) * sin(x+1)
plot(g, 0, 10)
fzeros(g', 0, 10)
fzeros(g'', 0, 10)
```