

Name: _____

EMSE 4571 / 6571: Quiz 3 (E)

Rules:

- Work alone; no outside help of any kind is allowed.
- No calculators, no notes, no books, no computers, no phones.

1. Code tracing: 40 points

Consider the following function:

```
f <- function(x) {  
  x <- x + 1  
  y <- 2*x  
  cat(x)  
  x <- x + 1  
  y <- y %% x  
  cat(x, y)  
}
```

After running the code below in R, write in the space below what will print in the console. Be careful to write any potential line breaks on new lines.

f(6)

Solution:

78 1

2. TRUE or FALSE: 20 points

The trick of using `n %% 10` to “chop” numbers at the tens place (e.g. `456 %% 10 == 6`) works for both positive and negative numbers.

FALSE

3. Mystery function: 40 points

Consider the following function:

```
f <- function(x) {  
  test <- (x == as.integer(x)) &  
    (x >= 0) &  
    (round(x^(1/2))^2 == x)  
  return(test)  
}
```

What must be true about x for $f(x)$ to return TRUE?

Solution: x is a positive perfect square.

Bonus: 5 points

TRUE or FALSE: For all integers x where $x < 0$, the statement $(x \mid 1) \geq x$ will return TRUE.

TRUE