

Homework 4

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Exercise 20) Define a function called `crit` that computes the **critical point(s)** of a quadratic function

```
def crit(a,b):  
    return (-b/(2*a))  
  
crit(5,3)
```

-0.3

Exercise 21) Define a function `div5` that determines if an integer `n` is divisible by 5 or not. If the number is divisible by 5, the function should return the Boolean value `True`. If the number is not divisible by 5, the function should return the Boolean value `False`. Call the function on `n = 20` and `n = 21`.

```
def div5(x):  
    if x % 5 == 0:  
        return(True)  
    else:  
        return(False)
```

```
div5(20)
```

True

```
div5(21)
```

False

Exercise 22) Suppose that you can rent a car for \$150 per day or buy it for \$3,500. Define a function called `car_option` that, given an integer $n \geq 0$, determines if it is cheaper to rent the car for n days or to buy it. If it is cheaper to rent the car, the function should return a 1. If it is cheaper to buy the car, the function should return a 0. Call the function for $n = 24$. Is it cheaper to rent or buy?

```
daily_rent = 150
total_cost = 3500

def car_option(n):
    if n * daily_rent <= total_cost:
        return(1)
    else:
        return(0)

car_option(24)
```

0

Exercise 23) Define a function called `num_real_roots` that computes the number of distinct real roots of a quadratic polynomial ax^2+bx+c where $a \neq 0$. Find the number of distinct real roots for $a=5$, $b=2$, and $c=-1$.

```
def num_real_roots(a,b,c):
    if b**2 - 4*a*c > 1:
        return(2)
    elif b**2 - 4*a*c > 1 == 0:
        return(1)
    else: return(0)

num_real_roots(5,2,-1)
```

2