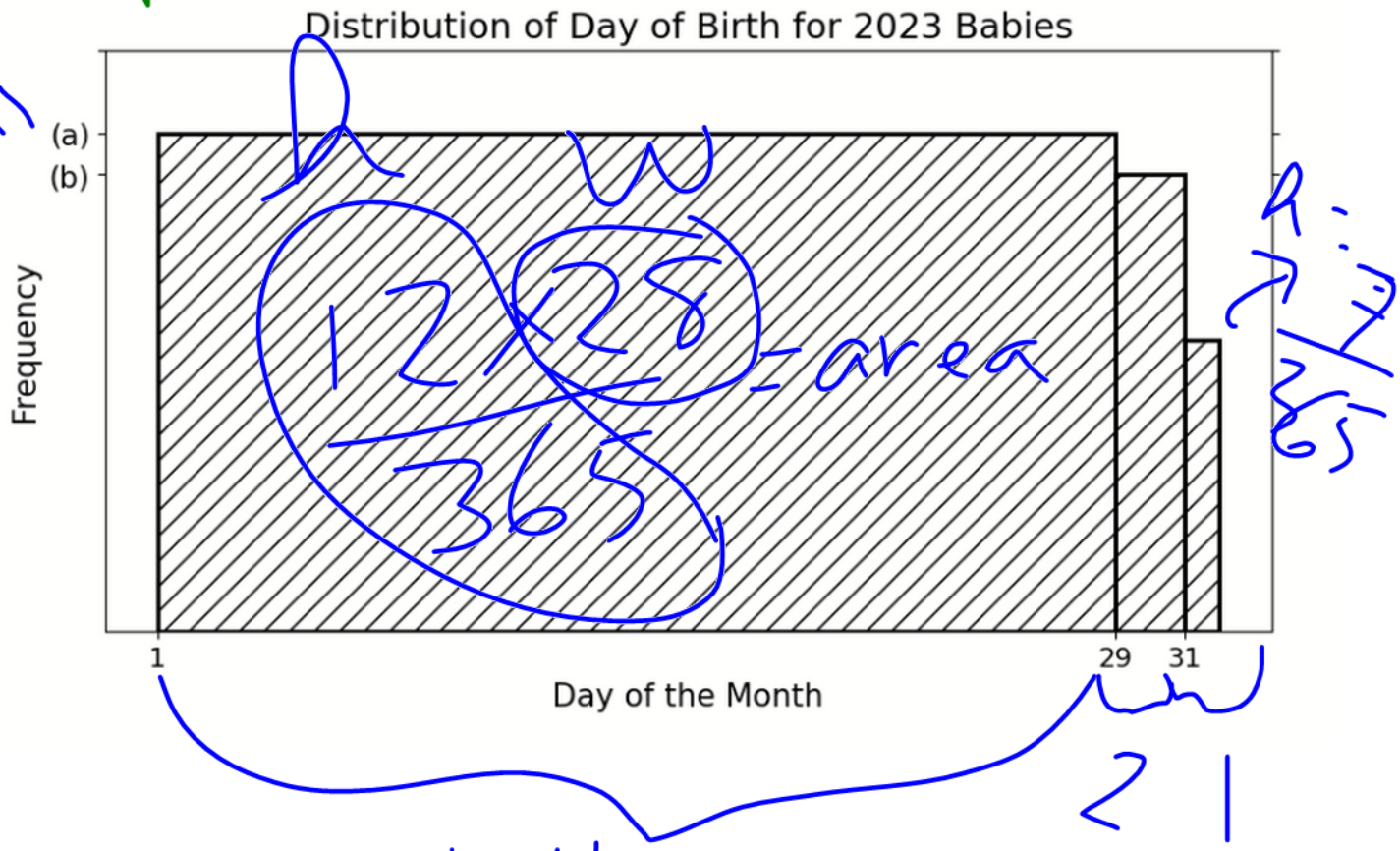
Sp24 Midterm

12.

$\frac{12}{365} =$



$\frac{12 \times 28}{365}$ = area

$\frac{7}{365}$

2 1

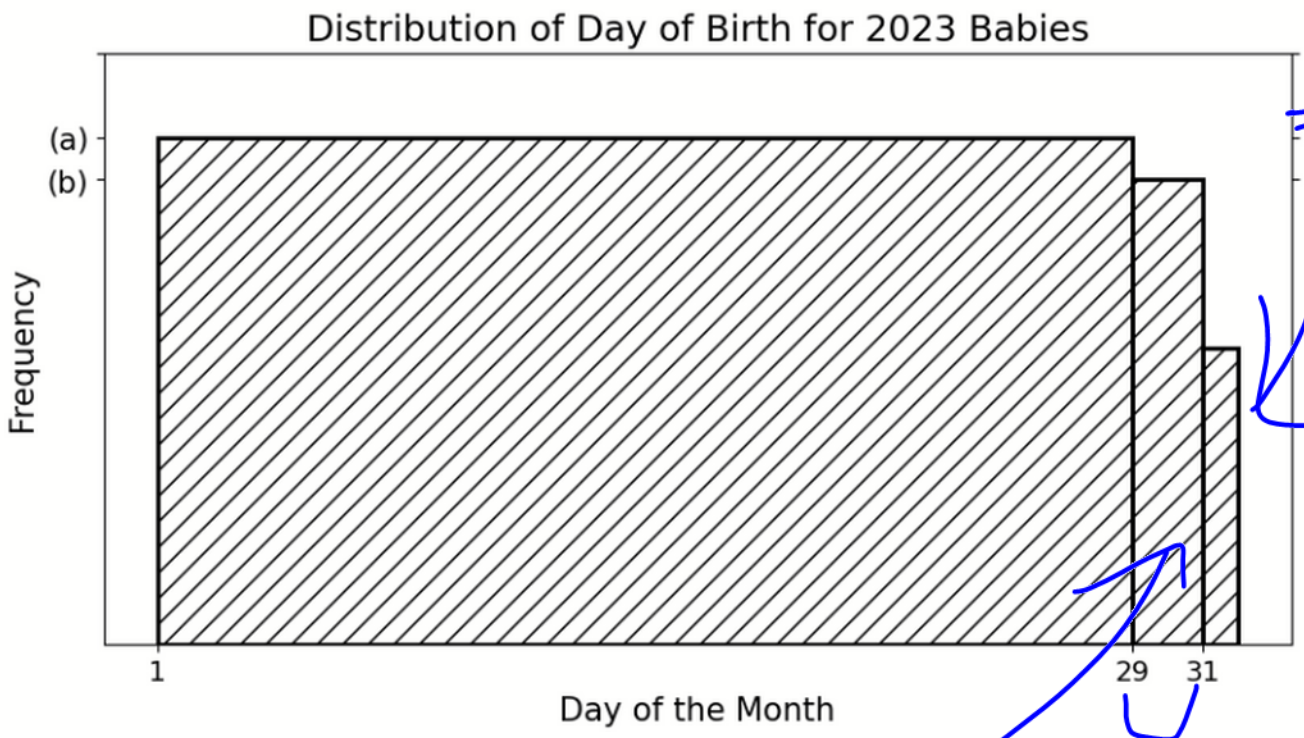
width

28

how many days in year are numbered 1-28

how many days in year

$= \frac{12 \times 28}{365}$



area

7

365

2

area

w

11 × 2

29th

and

30th

all

but

Feb

365 h

12 × 28 + 11 × 2 + 7

= 365

SP24 Final

PID: _____

Question 12 (20 pts)

Suppose you know the following information.

- The average monthly rent for the apartments in `apts` is \$3,000 with a standard deviation of \$400.
- The average size of the apartments in `apts` is 2,000 square feet, with a standard deviation of 100 square feet.
- The correlation coefficient between rent and square footage is 0.9.

For all parts of this question, give your answer as an **integer**.

a) (4 pts) Suppose the rents are normally distributed. What is the rent below which 84% of apartments are priced?

84%

b) (4 pts) Sophie's apartment rents for \$5,000. What is this rent in standard units?

5000 − 3000 / 400 = 2000/400 = 5

5

c) (4 pts) Based on what you know about the rent of Sophie's apartment, use the regression line to predict the square footage of Sophie's apartment.

in standard units: $y_{su} = r * x_{su} = 0.9 * 5 = 4.5$

2450

2000 + 4.5 * 100 = 2450

d) (4 pts) Sophie's apartment is actually 2,300 square feet. What is the residual of your prediction?

actual − pred: 2300 − 2450

−150

I know

e) (4 pts) Cici's apartment is 1,800 square feet. Based on this information, use the regression line to predict the rent of Cici's apartment.

in original units

2280

$m = \frac{r SD_y}{SD_x} = \frac{0.9 * 400}{100} = 3.6$

$b = \text{mean } y - m * \text{mean } x = 3000 - 3.6 * 2000$

$y = mx + b$

$y = 3.6(1800) - 4200$

$= 3000 - 7200$

$= -4200$

$= 2280$

Question 13 (13 pts)

a) (3 pts) Values in the `"Bath"` column are `"One"`, `"One and a half"`, `"Two"`, `"Two and a half"`, and `"Three"`. Fill in the blank in the function `float_bath` that will convert any string from the `"Bath"` column into the corresponding number of bathrooms, as a float. For example `float_bath("One and a half")` should return `1.5`.

```
def float_bath(s):
    if "One" in s:
        n_baths =  1
    elif "Two" in s:
        n_baths = 2
    else:
        n_baths = 3
    if "and a half" in s:
        __(a)__
    return n_baths
```

What goes in blank `(a)`?

b) (6 pts) Values in the `"Lease Term"` column are `"1 month"`, `"6 months"`, and `"1 year"`. Fill in the blanks in the function `int_lease()` that will convert any string from the `"Lease Term"` column to the corresponding length of the lease, in months, as an integer.

```
def int_lease(s):
    if s[-1] == "r":
        return __(b)__
    else:
        return __(c)__
```

What goes in blank `(b)`?

What goes in blank `(c)`?