# Activity 3

Name here

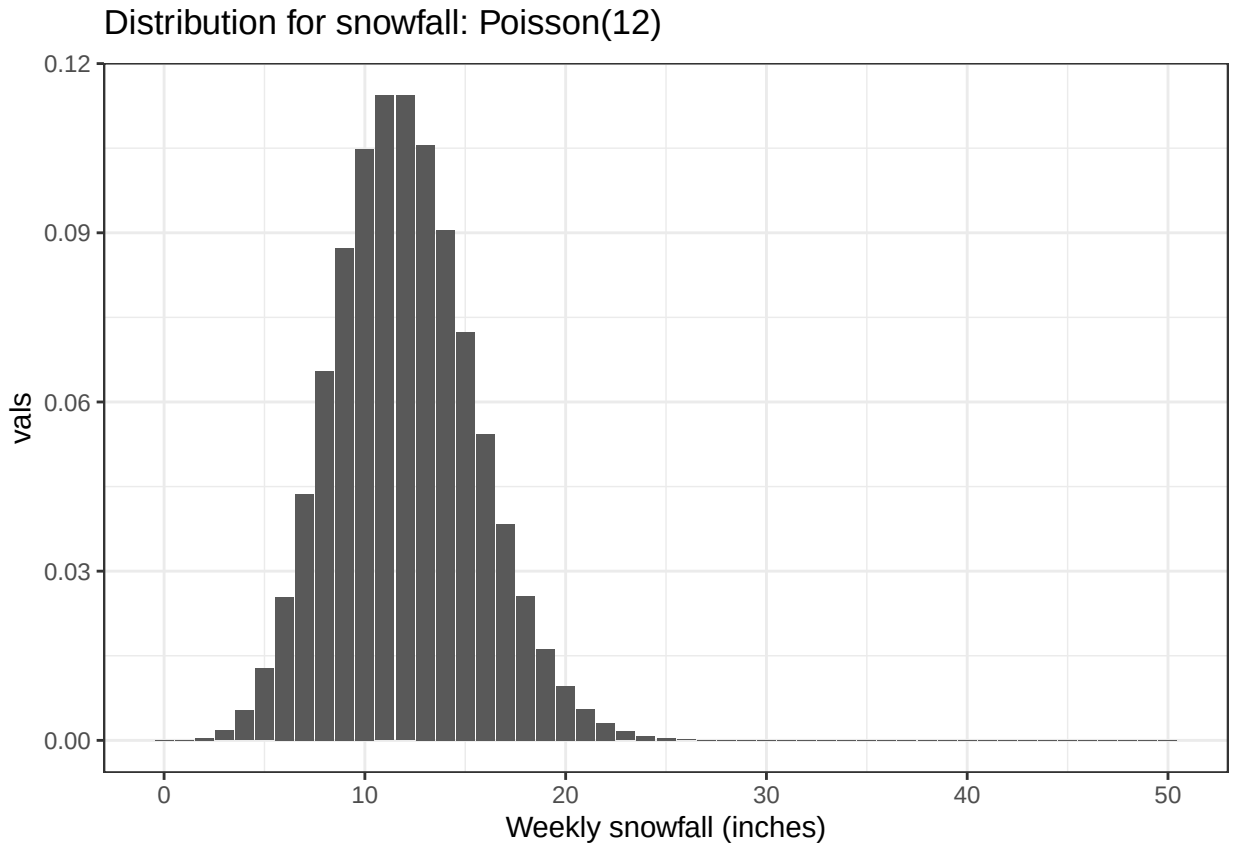
**Q1.**

Suppose we have a probability mass function for weekly winter snowfall at bridger bowl that temperature in Hyalite that is Poisson with mean of 12 inches. This

```
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.2 --
## v ggplot2 3.4.0     v purrr   0.3.4
## v tibble  3.1.8     v dplyr   1.0.9
## v tidyr   1.2.0     v stringr 1.4.1
## v readr   2.1.2     v forcats 0.5.2
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
snow_seq <- 0:50
tibble(vals = c(dpois(snow_seq, 12)),
       `Weekly snowfall (inches)` = snow_seq) %>%
  ggplot(aes(x = `Weekly snowfall (inches)`, y = vals)) +
  geom_col() + theme_bw() +
  ggtitle(expression(paste('Distribution for snowfall: Poisson(12)')))
```



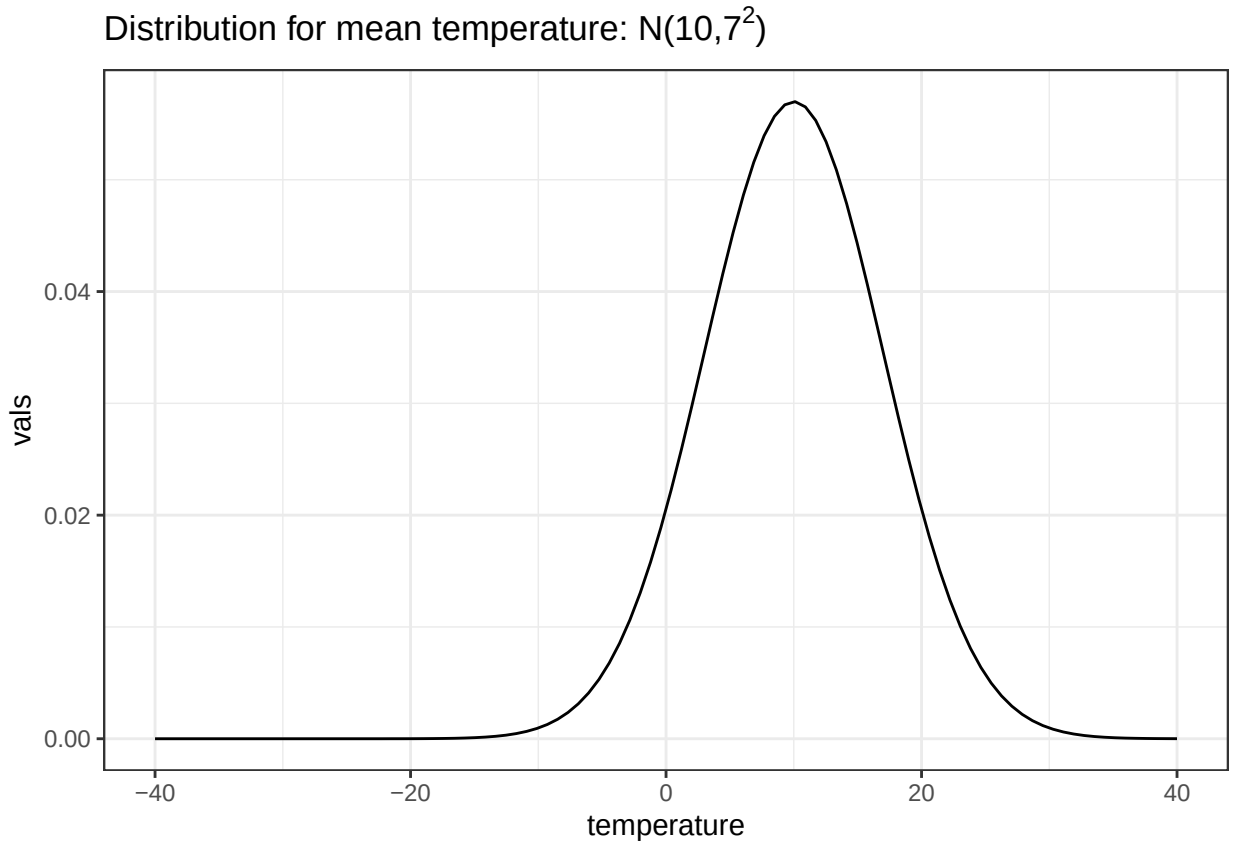

Answer the following questions with an numeric answer and a description of why that answer is true.

- According to this distribution, what is the probability of a week having 12 inches of snow? (Hint `dpois()`)
- According to this distribution, what is the probability of a week having more than 12 inches of snow? (Hint `ppois()`)
- According to this distribution, what is the probability of a week having 33 inches of snow (As of Jan 29, Bridger Bowl has reported 33 inches in last week)?
- Based on the last question, do you have any concerns with this function for snowfall?

**Q2.**

Suppose we have a probability distribution for average temperature in Hyalite that is Normal with mean = 10 and standard deviation = 7.

```
temp_seq <- seq(-40,40, length.out = 100)
tibble(vals = c(dnorm(temp_seq, 10, 7)),
       temperature = temp_seq) %>%
  ggplot(aes(x = temperature, y = vals)) +
  geom_line() + theme_bw() +
  ggtitle(expression(paste('Distribution for mean temperature: N(10,',7^2,')')))
```




Answer the following questions with an numeric answer and a description of why that answer is true.

- What is the probability that the temperature is greater than 10 degrees?
- What is the probability that the temperature is less than 0 degrees? (Hint `pnorm`)

**Q3.**

Yahtzee is a dice game where players roll 5 dice. A yahtzee (all 5 dice with the same value) is worth 50 points and a large straight (a run of 5 consecutive values) is worth 40 points. Use a Monte Carlo technique to calculate the probability of each of these outcomes, given a single roll.