PS-Lab sheet 07

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Exercise

1. A train arrives at a station uniformly between 8:00 a.m. and 8:40 a.m. Let the random variable X represent the number of minutes the train arrives after 8:00 a.m. What is the probability that the train arrives between 8:10 a.m. and 8:25 a.m.?

```
#1
punif(25, min=0, max=40, lower.tail=TRUE) - punif(10, min=0, max=40,
    lower.tail=TRUE)
```

```
[1] 0.375

=== Code Execution Successful ===
```

2. The time (in hours) to complete a software update is exponentially distributed with rate λ = 1 3 . Find the probability that an update will take at most 2 hours.

```
#2
pexp(2, rate=1/3, lower.tail=TRUE)
```

```
[1] 0.4865829

=== Code Execution Successful ===
```

3. Suppose IQ scores are normally distributed with a mean of 100 and a standard deviation of 15.

i. What is the probability that a randomly selected person has an IQ above 130?

```
#3(i)
pnorm(130, mean=100, sd=15, lower.tail=TRUE)
```

```
[1] 0.9772499

=== Code Execution Successful ===
```

ii. What IQ score represents the 95th percentile?

```
#3(ii)
qnorm(0.95, mean=100, sd=15, lower.tail=TRUE)
```

```
[1] 124.6728

=== Code Execution Successful ===
```