Problem Set 6

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STAT 100, SECTION 0221

PROBLEM #1

A. P(X < 500)
Z-Score: (500 - 528) / 120 = -0.23
P(Z < - 0.23) = 0.4090

```
> #1(b) - calculating (P < 500), by Kristina Finley
> pnorm(500, mean = 528, sd = 120)
[1] 0.4077513
>
```

PROBLEM #2

P(X < 500)
Z-Score: (500 / 519) / 116 = -0.16
P(Z < - 0.16) = 0.4364

PROBLEM #3

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> #3 - calculating (P < 500) for females, by Kristina Finley
> pnorm(500, mean = 519, sd = 116)
[1] 0.434947
>
```

PROBLEM #4

A. P(X > 625)
Z-Score: (625 - 528) / 120 = 0.81
P(Z > 0.81) = 0.7910 → 1 - 0.7910 = 0.209

```
> #4(b) - calculating (P > 625) , by Kristina Finley
> pnorm(625, mean = 528, sd = 120, lower.tail = FALSE)
[1] 0.2094494
>
```

PROBLEM #5

P(550 < X < 650)
Z-Score: (550 - 519) / 116 = 0.27 → 0.6064
Z-Score: (650 - 519) / 116 = 1.13 → 0.8708
P(0.27 < X < 1.13) → 0.8708 - 0.6064 = 0.2644

PROBLEM #6

```
> #6 - calculate P(550 < X < 650), by Kristina Finley
> pnorm(650, mean = 519, sd = 116, lower.tail = TRUE) - pnorm(550, mean = 519,
+ sd = 116, lower.tail = TRUE)
[1] 0.2652582
>
```

PROBLEM #7

A. Z-Score: (690 - 537) / 123 = 1.24
P(Z < 690) = 0.8925 → 89
A male student with an SAT Math score of 690 is in the 89th percentile.

```
> #7(b) - calculating (P < 690) , by Kristina Finley
> pnorm(690, mean = 537, sd = 123, lower.tail = TRUE)
[1] 0.8932323
> # calculate the rounded percentile
> round(100*(pnorm(690, mean = 537, sd = 123, lower.tail = TRUE)), 0)
[1] 89
>
```

PROBLEM #8

```
> #8 - calculating the 67th percentile , by Kristina Finley
> qnorm(0.67, mean = 528, sd = 120, lower.tail = TRUE)
[1] 580.7896
> # calculate the rounded 67th percentile
> round(qnorm(0.67,mean = 528, sd = 120, lower.tail = TRUE),0)
[1] 581
>
```

PROBLEM #9

P(X > 700)
Female: (700 - 519) / 116 = 1.56
P(Z > 700) : 0.9406 → 1 - 0.9406 = 0.0594

P(X > 720)
Male: (720 - 537) / 123 = 1.49
P(Z > 720): 0.9319 → 1- 0.9319 = 0.0681

0.0681 > 0.0594 It is more likely male students will have a score of at least 720.