Homework 7

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Problem 1

```
pnorm(170, mean = 180, sd = 25/sqrt(9))
```

```
## [1] 0.1150697
```

Probability that the mean weight of 9 people is less than 170 lbs is 0.115

```
pnorm(170, mean = 180, sd = 25)
```

```
## [1] 0.3445783
```

Probability that a randomly selected indivudual has wt < 170 is 0.345.

Problem 2 a)

```
xbar <- 2 / 30
z <- 1.960
se <- sqrt(xbar * (1 - xbar) / 30)
lwr <- xbar - z * se
upr <- xbar + z * se
ci95 <- c(lwr, upr)
```

Problem 2 b)

There is 95% confidence that the true mean is contained in the interval ci95 = (-0.0226, 0.1559). # Problem 2 c)

```
w1 <- 2 / 30
w2 <- 10 / 61
n1 <- 30
n2 <- 61
diff <- w1 - w2
se = sqrt(w1 * (1 - w1) / n1 + w2 * (1 - w2) / n2)
z <- 1.960
lwrw <- diff - z * se
uprw <- diff + z * se
ci95w <- c(lwrw, uprw)
```

confidence interval is [-0.2261, 0.0316] # Problem 2 d Look at the intersection ci95 and ci95w. This is [-0.0226, 0.0316] a small interval around 0. The first confidence interval was more to the positive end, and the confidence interval of thd difference was more negative. This suggests w1>w2.

Problem 4

```
library(UsingR)
```

```
## Loading required package: MASS
## Loading required package: HistData
## Loading required package: Hmisc
## Loading required package: lattice
## Loading required package: survival
## Loading required package: Formula
## Loading required package: ggplot2
##
## Attaching package: 'Hmisc'
## The following objects are masked from 'package:base':
##
##     format.pval, units
##
## Attaching package: 'UsingR'
## The following object is masked from 'package:survival':
##
##     cancer
```

```
data("stud.recs")
dat = stud.recs
n = nrow(dat)
xbar = mean(dat$sat.v)
se = sd(dat$sat.v) / sqrt(n)

t = qt(1 - 0.05 / 2, df = 159) #df = n-1
lwr = xbar - t*se
upr = xbar + t*se
ci95 = c(lwr,upr)
ci95
```

```
## [1] 441.8951 469.7924
```

Confidence interval 95% is [422, 470]