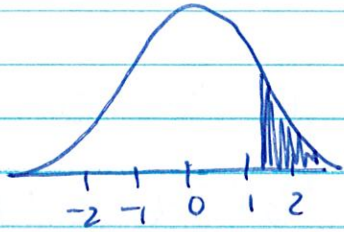
Stat: pg. 291 1-12 All

1. $\mu = \$151$ $\sigma = \$49$ $n = 50$

a) $\mu_{\bar{x}} = \$151$ $\sigma_{\bar{x}} = \frac{49}{\sqrt{50}} = 6.93$

b) $P(\bar{x} > 160)$

$z = \frac{160 - 151}{6.93} = 1.299$

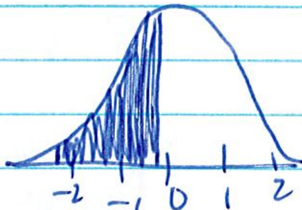


Normalcdf(1.299, 100000) = .0970

The prob a random sample of 50 has a mean of greater than 160 is .0970 or 9.7% of time.

c) $P(135 < \bar{x} < 150)$

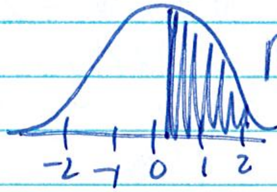
$z = \frac{135 - 151}{6.93} = -2.31$ $z = \frac{150 - 151}{6.93} = -.14$



normalcdf(-2.31, -.14) = .4339

43.39% of the time a sample of 50 will have a mean of between \$135 & \$150 spent.

2. $\mu = 18$ $\sigma = 7.6$

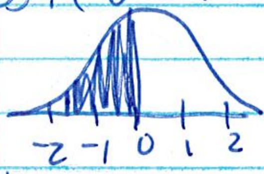


Normalcdf(.2632, 1000)

a) $P(X > 20) \approx P(Z > .2632)$

$z = \frac{20 - 18}{7.6} = .2632$ $P(X > 20) = .3962$

b) $P(0 < X < 5)$ $z = \frac{0 - 18}{7.6} = -2.37$ $z = \frac{5 - 18}{7.6} = -1.71$

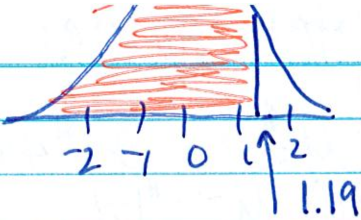


Normalcdf(-2.37, -1.71) = $\boxed{.0347}$

c) $P(X < 9 \text{ or } X > 27) = \boxed{.2380}$

$z = \frac{9 - 18}{} = -1.18$ $z = \frac{27 - 18}{} = 1.18$

3. Find X 88.3% to left

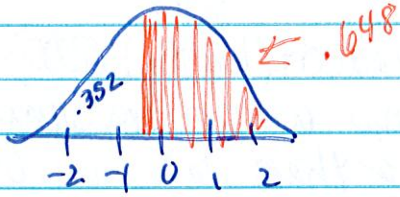



Invnormal(.883) = 1.19

$z = \frac{x - \mu}{\sigma}$ $1.19 = \frac{x - 18}{7.6}$

a raw score of 27.04 corresponds to 88.3% left

4. 64.8% Right




Invnormal(.352) = -.3799

$z = \frac{x - \mu}{\sigma}$ $-.3799 = \frac{x - 18}{7.6}$

Raw score of 15.113 corresponds to a 64.8% to right

5. $p = .64$ $q = .36$ $n = 20$

$20(.64) = 12.8$ $20(.36) = 7.2$ both greater than 5 so good to go

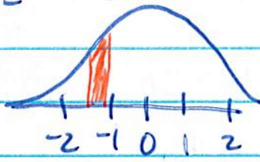
$\mu = .64(20) = 12.8$

$\sigma = \sqrt{.64(20)(.36)} = 2.15$

a) P(exactly 10) $P(9.5 < X < 10.5)$

$z = \frac{9.5 - 12.8}{2.1466} = -1.5373$ $z = \frac{10.5 - 12.8}{2.1466} = -1.07$

d. Not Unusual for exactly 10




Normalcdf(-1.5372, -1.0715)

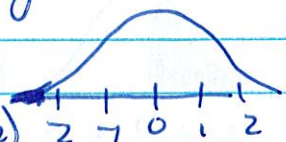
.0799

The prob exactly 10 adults will say watch NFL is .0799.

b. P(less than 7) = $P(X < 6.5)$

$z = \frac{6.5 - 12.8}{2.15} = -2.9302$

normalcdf(-10000, -2.9302)




d. .0017 Very unusual because lower than .05.

c. P(atleast 15) $P(X > 14.5)$

6. $p = .86 \quad q = .14 \quad n = 30$

$np = (.86)(30) = 25.8 \qquad nq = (.14)(30) = 4.2 < 5$

Cannot use a Normal distribution because $nq \not< 5$

Just like learn 4.2

a) $P(X=25)$ = binompdf(30, .86, 25) = .177

b) $P(\text{More than } 25) = P(X \geq 26)$

$P(26) + P(27) + P(28) + P(29) + P(30)$

| L1 | binompdf |
|---|---|
| 26 | .2086 |
| 27 | .1898 |
| 28 | .1249 |
| 29 | .0529 |
| 30 | .0108 |

$P(X \geq 26) = .5871$

c) $P(X < 25) = 1 - P(X \geq 25)$

$1 - (P(25) + P(26) + P(27) + P(28) + P(29) + P(30))$

$1 - (.1766 + .2086 + .1898 + .1249 + .0529 + .010$

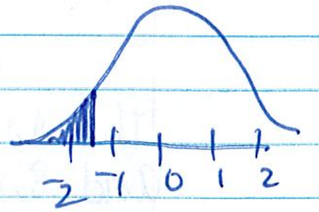
$1 - .7637$

$P(X<25) = .2363$

d) No Unusual events because all probs greater than .05.

7. $\mu = 6.7 \quad \sigma = 1.8$

$P(X<4) \qquad z = \dfrac{4-6.7}{1.8} = -1.5$




Normalcdf(-100000, -1.5) = .0668

Not Unusual greater than .0668

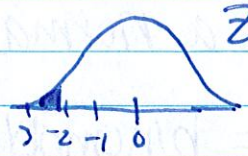
So spending less than 4 hrs a week not Unusual

8. $P(X>10) \qquad z = \dfrac{10-6.7}{1.8} = 1.833$


Normalcdf(1.833, 100000) = .0333

9. $n = 800$ Expect P( between 2 . 3 hrs

$z = \frac{2 - 6.7}{1.8} = -2.611$




$z = \frac{3 - 6.7}{1.8} = -2.055$

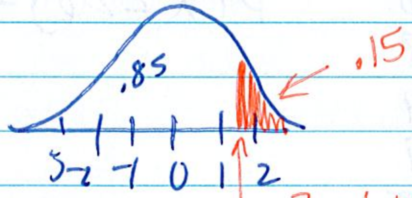
normalcdf(-2.611, -2.055)

$.0154 \cdot 800 = 12.34$

We can expect ≈ 12 Facebook users to be on Facebook between 2 & 3 hrs a week.

10. lowest top 15%

Invnorm(.85) = 1.0364

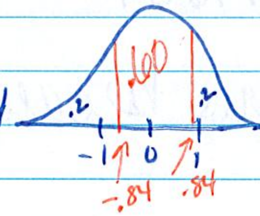



$z = \frac{X - \mu}{\sigma}$ $\quad 1.0364 = \frac{X - 6.7}{1.8}$

The cut off number of hours for the top 15% of facebook users would be 8.57 hours.

11. Middle 60%

Invnormal(.2) = -.84




$-.84 = \frac{X - 6.7}{1.8}$ $\qquad .84 = \frac{X - 6.7}{1.8}$

5.19 hrs $\qquad X = 8.21$ hrs.

The middle 60% would be inbetween 5.19 hour and 8.21 hours.

12. $n = 8$ $\quad \mu_{\bar{x}} = 6.7$ $\quad \sigma_{\bar{x}} = \frac{1.8}{\sqrt{8}} = .6364$

Yes by CLT when the original population is normally distributed you can have any