5.5 Foundations of Math 11

p. 264 #5-9, 11, 13, 15-17

5. a) $z = \frac{29.3 - 24}{28}$ ($z = \frac{x - \mu}{\sigma}$)

$z = 0.1893$

b) $z = \frac{36 - 165}{48}$

$z = -2.6875$

c) $z = \frac{817 - 784}{65.3}$

$z = 0.5054$

d) $z = \frac{3.4 - 2.9}{0.3}$

$z = 1.6667$

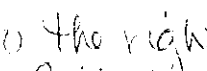
6. Use the table  to find values to the left

a) $z = 0.56$
use 0.5 on left
and 0.06 on top
0.7123 = 71.23%

b) $z = -1.76$
use -1.7 on left
and 0.06 on top
0.0392 = 3.92%

c) $z = -2.98$
use -2.9 on left
and 0.08 on top
0.0014 = 0.14%

d) $z = 2.39$
use 2.3 on left
and 0.09 on top
0.9916 = 99.16%

7. To find values to the right  , use 1 - (the area on the left)
Use the table to find the area on the left, then subtract

a) $z = -1.35$
area to left: 0.0885
area to right: $1 - 0.0885 =$
$0.9115 =$
91.15%

b) $z = 2.63$
area to left: 0.9957
area to right: $1 - 0.9957 =$
$0.0043 =$
0.43%

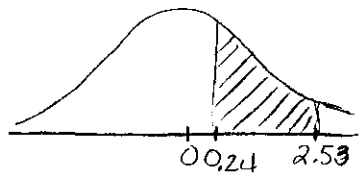
c) $z = 0.68$
area to left: 0.7517
area to right: $1 - 0.7517 =$
$0.2483 =$
24.83%

d) $z = -3.14$
$0.9992 = 99.92\%$

done on graphing calc

p.264 cont.

8. a)

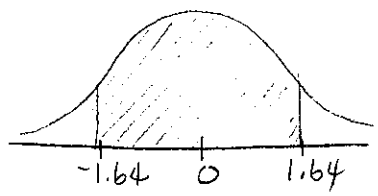


Find the area to the left of 2.53 then subtract the area to the left of 0.24 (use the z-score chart)

2.53 is 0.9943
0.24 is 0.5948

0.9943 - 0.5948 = 0.3995
0.3995 = 39.95%

b)



1.64 is 0.9495
-1.64 is 0.0505

0.9495 - 0.0505 = 0.8990
0.8990 = 89.9%

9. Use the z-score chart to find the percent (as a decimal) in the body and read the z-score off the left and top scales.

a) 33% = 0.33 left

0.04 ↑

-0.4 ← 0.33

-0.44

b) 20% to the right is 100% - 20% = 80% to the left

80% = 0.8

0.04 ↑

0.8 ← 0.7995 closest to 0.8

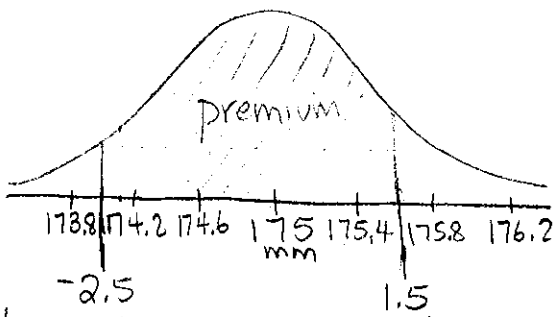
0.8 0.8023

0.84

p.264 cont.

11. Average thickness = 175mm
Standard deviation = 0.4 mm
premium flooring is 174mm - 175.6mm

$z = \frac{x-\mu}{\sigma}$



standardize the 174 and 175.6

$z = \frac{174-175}{0.4}$ $z = -2.5$

$z = \frac{175.6-175}{0.4}$ $z = 1.5$

Use the z-score chart to find percents, and subtract

$-2.5 \rightarrow 0.0062$

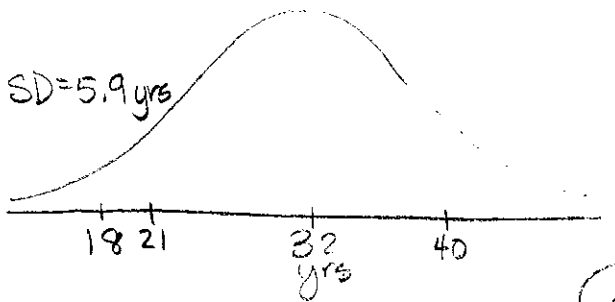
$1.5 \rightarrow 0.9332$

$0.9332 - 0.0062 = 0.927$

$0.927 = 92.7\%$

92.7% of the flooring is premium.

12.



Drawing a diagram will help you see if your answer is reasonable

Standardize your years and use the z score chart

a) $z = \frac{40-32}{5.9}$

$z = 1.36 \rightarrow 0.9131 = 91.31\%$

b) $z = \frac{21-32}{5.9}$

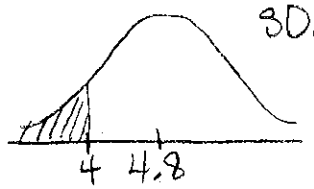
$z = -1.86 \rightarrow 0.0314 = 3.14\%$

c) $z = \frac{18-32}{5.9}$

$z = -2.37 \rightarrow 0.0089 = 0.88\%$

p. 264 cont.

15. a)

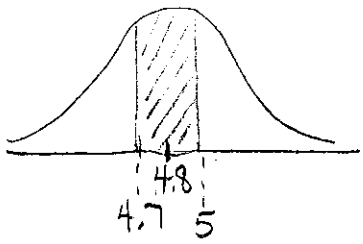


SD: 0.3

$Z = \frac{4 - 4.8}{0.3}$

$Z = -2.67 \rightarrow 0.0038 = 0.38\%$

b)



$Z = \frac{4.7 - 4.8}{0.3}$ $\quad$ $Z = \frac{5 - 4.8}{0.3}$

$Z = -0.33$ $\quad$ $Z = 0.67$

$\downarrow$ $\quad$ $\downarrow$

0.3707 $\quad$ 0.7486

$0.7486 - 0.3707 = 0.3779$

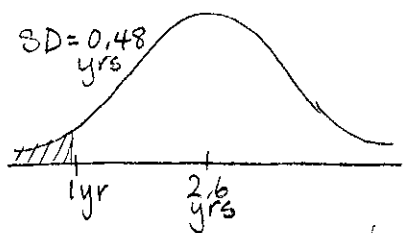
$0.3779 = 37.79\%$

c) $\quad$ 0.04 $\quad$ 0.05

$\uparrow$ $\quad$ $\uparrow$

1.6 $\leftarrow$ 0.9495 $\quad$ 0.95 $\quad$ 0.9505

16.



a) $Z = \frac{1 - 2.6}{0.48}$

done on graphing calc

$\downarrow$

$Z = -3.33 \rightarrow 0.000434$

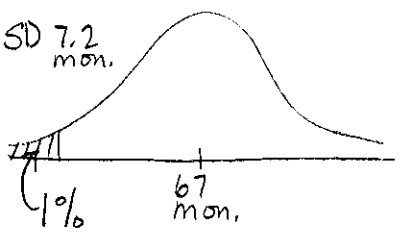
$0.000434 (4000) = 1.736$

about 2 MP3 players fail before 1 yr

b) $Z = \frac{2 - 2.6}{0.48}$

$Z = -1.25 \rightarrow 0.1056 = 10.56\%$ will need repair in 2 yrs

17.



1% = 0.01 $\quad$ 0.03 $\quad$ (-2.33)

$\uparrow$

-2.3 $\leftarrow$ 0.0099 $\quad$ [0.01] $\quad$ 0.0102

closer

$-2.33 = \frac{X - 67}{7.2}$

$-16.776 = X - 67$

$50.224 = X$

about 50 months or 4 years