Assignment 4

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a) $\$ 225\,000 - \$ 200\,000 = \$ 25\,000$

$$P(X) = \begin{cases} \frac{1}{25000} & \text{for } 200\,000 \leq X \leq 225\,000 \\ 0, & \text{elsewhere} \end{cases}$$

b) $P(X \geq 215\,000) = \frac{1}{25000} \cdot 10000 = \frac{10}{25} = \frac{2}{5}$

c) $P(X < 210\,000) = \frac{1}{25\,000} \cdot 10\,000 = \frac{10}{25} = \frac{2}{5}$

d) It is more likely that the executive gets more than \$ 210 000 by leaving the house on the market for another month than less than \$ 210000. I would advise her to leave the house for sale, if she doesn't mind the risk. Also, she has more to gain by leaving the house for sale

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a) $\mu = 658$

$P(X \leq 610) = 0{,}03 \rightarrow \quad z = -1{,}88 = \frac{610 - 658}{\sigma} \rightarrow \quad \sigma = 25{,}53$

b) $P(600 \leq X \leq 700) = P(X \leq 700) - P(X \leq 600)$

$X \leq 700: \quad z = \frac{700 - 658}{25{,}53} = 1{,}65, \quad P(z \leq 1{,}65) = 0{,}9505$

$X \leq 600: \quad z = \frac{600 - 668}{25{,}53} = -2{,}27, \quad P(z \leq -2{,}27) = 0{,}0116$

$P(600 \leq X \leq 700) = 0{,}9505 - 0{,}0116 = 0.9389$

c) $0{,}97 \rightarrow z = 1{,}88,$

$\frac{X - 658}{25{,}53} = 1{,}88 \rightarrow X = 706$

706 people bring items to the pawnshop on the busiest 3% of days.

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$\mu = 450$, $\sigma = 100$

a) $P(400 \leq X \leq 500) = P(X \leq 500) - P(X \leq 400)$

$X = 500 \rightarrow z = \frac{500-450}{100} = 0,5 \qquad P(z \leq 0,5) = 0,6915$

$X = 400 \rightarrow z = \frac{400-450}{100} = -0,5 \qquad P(z \leq -0,5) = 0,3085$

$P(400 \leq X \leq 500) = 0,6915 - 0,3085 = 0,383$

b) $P(X < 630) \rightarrow z = \frac{630-450}{100} = 1,8$, $P(z < 1,8) = 0,9641$

$P(X > 630) = 1 - P(X < 630) = 1 - 0,9641 = 0,0359$

c) $P(X \geqslant 480) = 1 - P(X \leq 480) \rightarrow z = \frac{480-450}{100} = 0,3$, $P(z \leq 0,3) = 0,6179$

$P(X \geqslant 480) = 1 - 0,6179 = 0,3821$

38,21% of the people taking the test would be acceptable to the university

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a) $\mu = 53\,901$
$\sigma = 15\,000$

$P(X \geqslant 65000) = 1 - P(X < 65\,000)$,

$z = \frac{65000-53901}{15000} = 0,74 \qquad , \quad P(z \leq 0,74) = 0,7704$

$P(X \geqslant 65000) = 1 - 0,7704 = 0,2296$

b) $\mu = 51\,541$
$\sigma = 11\,000$

$P(X \geqslant 65\,000) = 1 - P(X < 65000)$

$z = \frac{65000 - 51541}{11\,000} = 1,22 \quad , \quad P(z \leq 1,22) = 0,8888$

$P(X \geqslant 65000) = 1 - 0,8888 = 0,1112$

c) $P(X < 40\,000)$

$z = \frac{40\,000 - 51\,541}{11\,000} = -1{,}05$, $P(Z \leq -1{,}05) = \boxed{0{,}1469}$

d) $0{,}99 \rightarrow Z = 2{,}33$

$\frac{X - 51\,541}{11\,000} = 2{,}33$

$\boxed{X = 77171}$

\$77171 is a higher starting salary higher than 99% of all starting salaries of graduates in health sciences.

42 X = filling weight , $\sigma = 0{,}6$

$P(X \leq 18) = 0{,}02$

$0{,}02 \rightarrow Z = -2{,}05 \rightarrow -2{,}05 = \frac{18 - \mu}{0{,}02} = \boxed{19{,}23}$

The mean filling weight is 19,23