

8.3 Oppervlakte onder normaalkrommen

Opgave 33:

- a. dit volgt uit de vuistregels: $13,5 + 2,5 = 16\%$ dus 0,16
b. a 0,135
b. 0,975
c. 0,05
d. 0,84

Opgave 34:

- a. $Opp = normalcdf(-10^{99}, 5, 3.5, 1.1) = 0,914$
b. $Opp = normalcdf(700, 10^{99}, 850, 120) = 0,894$
c. $Opp = normalcdf(-10^{99}, 16, 17.1, 1.8) = 0,271$
d. $Opp = normalcdf(1000, 1100, 1080, 60) = 0,539$

Opgave 35:

- a. $Opp = normalcdf(-10^{99}, 480, 520, 18) = 0,013$
b. $Opp = normalcdf(510, 10^{99}, 520, 18) = 0,711$

Opgave 36:

- a. $normalcdf(-10^{99}, 5.1, 5.8, 0.4) = 0,040$ dus 4,0%
b. $normalcdf(5.25, 10^{99}, 5.8, 0.4) = 0,915$ dus 91,5%
c. $normalcdf(6.1, 6.4, 5.8, 0.4) = 0,160$ dus 16,0%

Opgave 37:

$$1 - 0,65 = 0,35$$

Opgave 38:

- a. $a = invnorm(0.3, 16, 2) = 15,0$
b. $a = invnorm(0.3, 50, 8) = 45,8$
c. $a = invnorm(0.86, 600, 70) = 675,6$
d. $a = invnorm(0.92, 0.8, 0.2) = 1,08$

Opgave 39:

- a. $\frac{2}{3}$
b. $a = invnorm(\frac{1}{3}, 40, 5) = 37,8$
 $b = invnorm(\frac{2}{3}, 40, 5) = 42,2$

Opgave 40:

- $a = invnorm(0.2, 1000, 50) = 958$
 $b = invnorm(0.4, 1000, 50) = 987$
 $c = invnorm(0.6, 1000, 50) = 1013$ of 987 spiegelen t.o.v. 1000 geeft 1013
 $d = invnorm(0.8, 1000, 50) = 1042$ of 958 spiegelen t.o.v. 1000 geeft 1042

Opgave 41:

- a. $a = \text{invnorm}(0.25, 18, 2) = 16,7$
 $b = \text{invnorm}(0.75, 18, 2) = 19,3$
- b. $a = \text{invnorm}(0.09, 150, 12) = 133,9$
 $b = \text{invnorm}(0.91, 150, 12) = 166,1$
- c. $a = \text{invnorm}(0.06, 58, 6) = 48,7$
 $b = \text{invnorm}(0.94, 58, 6) = 67,3$

Opgave 42:

- a. $\text{normalcdf}(-10^{99}, 450, 400, \sigma) = 0,78$
- b. schatting: $\sigma = 60$
 $X \text{ min} = 50 \quad X \text{ max} = 100$
- c. $y_1 = \text{normalcdf}(-10^{99}, 450, 400, X)$
 $y_2 = 0,78$
intersect geeft $X = 64,8$ dus $\sigma = 64,8$

Opgave 43:

- a. $y_1 = \text{normalcdf}(-10^{99}, 170, X, 12)$
 $y_2 = 0,08$
- b. schatting: $\mu = 190$
 $X \text{ min} = 170 \quad X \text{ max} = 220$
- c. intersect geeft: $X = 187$ dus $\mu = 187$

Opgave 44:

- $y_1 = \text{normalcdf}(17, 10^{99}, X, 3.8)$
 $y_2 = 0,28$
intersect geeft $X = 14,8$ dus $\mu = 14,8$

Opgave 45:

- $y_1 = \text{normalcdf}(2080, 2320, 2200, X)$
 $y_2 = 0,62$
intersect geeft $X = 136,7$ dus $\sigma = 140$

Opgave 46:

- a. $y_1 = \text{normalcdf}(14.6, 10^{99}, X, 3.5)$
 $y_2 = 0,41$
intersect geeft $X = 13,8$ dus $\sigma = 13,8$
- b. $y_1 = \text{normalcdf}(14.6, 10^{99}, 12.3, X)$
 $y_2 = 0,41$
intersect geeft $X = 10,1$ dus $\sigma = 10,1$

Opgave 47:

- $\text{normalcdf}(2.18, 2.36, 2.3, 0.08) = 0,7066$
 $y_1 = \text{normalcdf}(2.18, X, 2.3, 0.08)$

$$y_2 = 0,3533$$

intersect geeft $X = 2,284$ dus $a = 2,284$

Opgave 48:

a. $normalcdf(-10^{99}, 18, 19.8, 3.2) = 0,287$

$$0,287 - 0,237 = 0,050$$

$$a = invnorm(0.050, 19.8, 3.2) = 14,54$$

of $0,287 + 0,237 = 0,524$

$$a = invnorm(0.524, 19.8, 3.2) = 19,99$$

b. $normalcdf(-10^{99}, 21.6, 19.8, 3.2) = 0,713$

$$0,713 - \frac{2}{3} \cdot 0,681 = 0,259$$

$$b = invnorm(0.259, 19.8, 3.2) = 17,73$$

$$0,713 + \frac{1}{3} \cdot 0,681 = 0,940$$

$$c = invnorm(0.940, 19.8, 3.2) = 24,78$$

De tweede mogelijkheid (verhouding 1:2) kan hier niet.

Opgave 49:

$$normalcdf(2910, 2923, 2830, \sigma) = normalcdf(2923, 10^{99}, 2830, \sigma)$$

$$y_1 = normalcdf(2910, 2923, 2830, X)$$

$$y_2 = normalcdf(2923, 10^{99}, 2830, X)$$

intersect geeft $X = 43,97$ dus $\sigma = 43,97$

Opgave 50:

$$y_1 = 2 \cdot normalcdf(-10^{99}, 732, X, 18.6)$$

$$y_2 = 3 \cdot normalcdf(732, 740, X, 18.6)$$

intersect geeft $X = 746,4$ dus $\mu = 746,4$

Opgave 51:

a. $normalcdf(-1, 1, 0, 1) = 0,6827$ dus 68,27%

b. $normalcdf(-2, 2, 0, 1) = 0,9545$ dus 95,45%