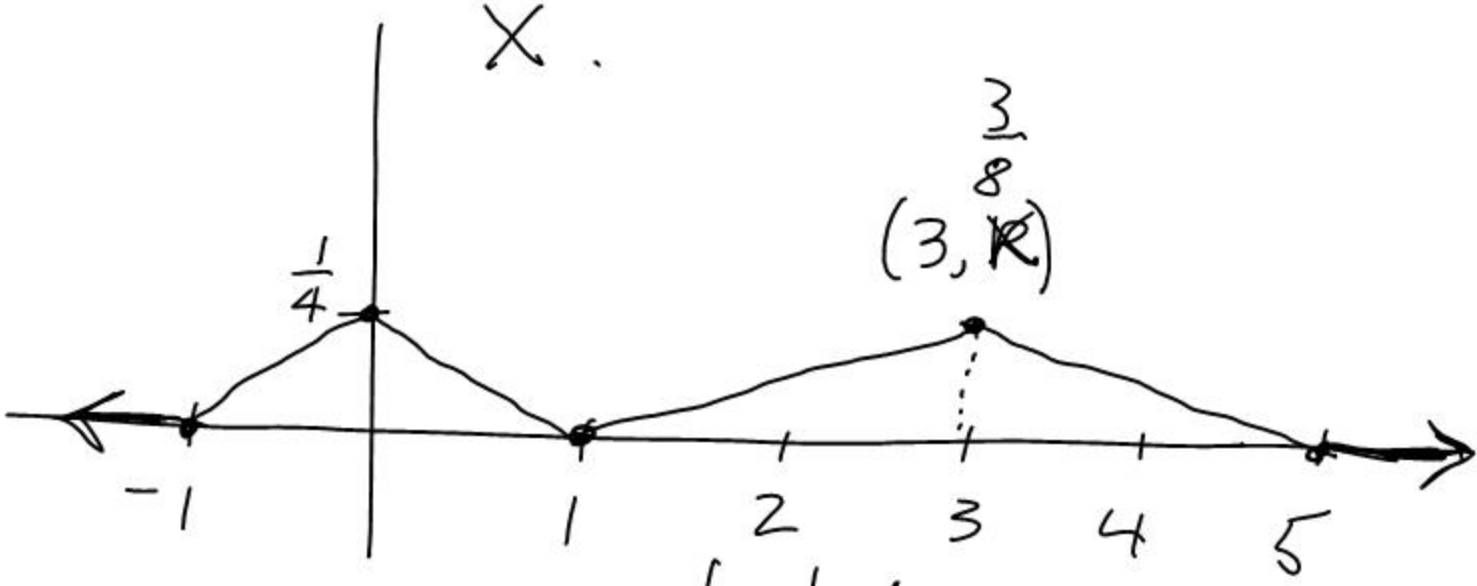
Ex. A pdf. for random variable X.



(a) Find k.

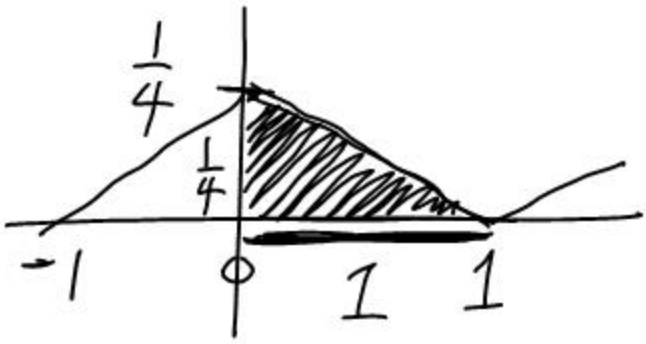
first Δ: $\frac{1}{2}(2)\left(\frac{1}{4}\right)$ + second Δ: $\frac{1}{2}(4)(k) = 1$

$\frac{1}{4} + 2k = 1$

$2k = \frac{3}{4}$

$k = \frac{1}{2} \cdot \frac{3}{4} = \frac{3}{8}$

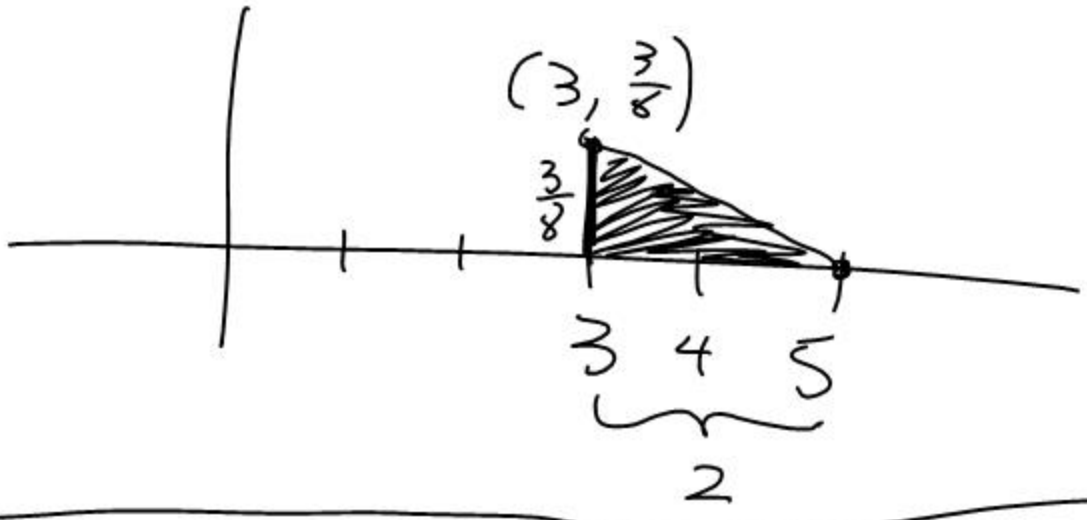
(b) Find $P(0 \le x \le 1)$



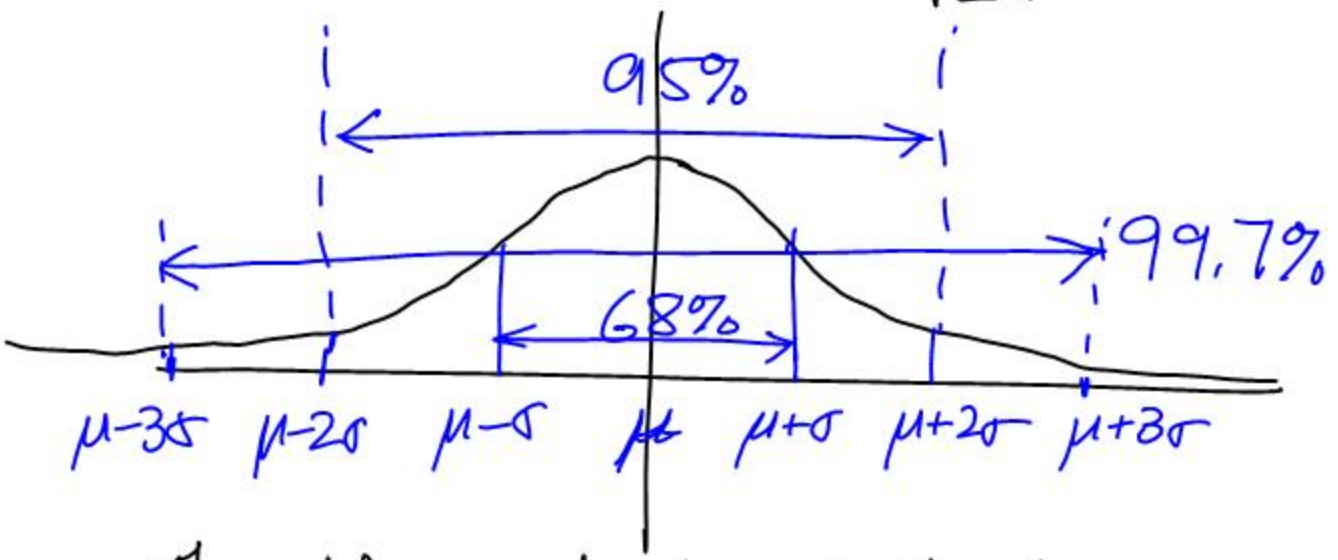
$= \frac{1}{2}(1)\left(\frac{1}{4}\right)$

$= \frac{1}{8}$

(c) Find $P(3 \leq X \leq 5) = \frac{1}{2}(2)\left(\frac{3}{8}\right)$



Another pdf: $f(x) = \frac{1}{\sqrt{2\pi}} \cdot e^{-\frac{x^2}{2}}$



The Normal Distribution

→ σ = standard deviation

→ μ = mean

Ex. SAT-M scores are normally distributed with $\mu = 500$ and $\sigma = 100$. X = an SAT-M score

(a) $P(400 \leq x \leq 600)$

$$z = \frac{x - \mu}{\sigma} = \text{how many standard deviations above or below the mean.}$$

$$z = \frac{400 - 500}{100} = -1$$

↑ 1 σ below μ

$$z = \frac{600 - 500}{100} = 1 \leftarrow 1\ \sigma \text{ above } \mu$$

$$P(400 \leq X \leq 600)$$

$$= P(-1 \leq Z \leq 1) = 0.683$$

(b) $P(500 \leq X \leq 620)$

$$= P(0 \leq Z \leq 1.2) = 0.385$$

$$Z = \frac{620 - 500}{100}$$

$$= \frac{120}{100} = 1.2$$

(c) $P(X \leq 350) = P(Z \leq -1.5)$

$$= 0.0668$$

$$Z = \frac{350 - 500}{100} = -1.5$$

use 9 for ∞

(d) $P(X \geq 750) = P(Z \geq 2,5)$

$$Z = \frac{750 - 500}{100} = 0.00621$$

$$= \frac{250}{100}$$

$$= 2,5$$

(e) $P(X = 750)$

$$= P(745 \leq X < 755)$$

Margaret Rose was here ♥ let's get bread