Example (Exercise 8.41)

a) Find $x^2_\alpha$ such that $P(X^2 > x^2_\alpha) = 0.99$
   when $\nu = 4$

   $P(X^2 > x^2_\alpha) = \alpha$ by definition
   so we want $X^2_{0.99}$ for $\nu = 4$

   $x^2_{0.99} = 0.297$ (row $\nu = 4$)

b) $P(X^2 > x^2_\alpha) = 0.025$ when $\nu = 19$

   $x^2_{0.025} = 32.852$ (row $\nu = 19$)

\[ x^2 \text{ is } x^2_{0.05} \]

This is from row $\nu = 25$ Table A.5

\[ \text{This area needs to be 0.045} \]

\[ \text{Area = 0.05 - 0.045} \]

\[ x^2_{0.005} = 46.928 \]

\[ x^2 \text{ limit is } x^2_{0.005} (\nu = 25) \]

\[ \text{total area here 0.05} \]
Example (Exercise 8.49)

a) This question is about the t-distribution. Given $n = 24$, find $k$ such that

$$ P(-2.069 < T < k) = 0.965 $$

From Table A.4 row $v = 24 - 1 = 23$, notice that 2.069 = $t_{0.025}$
Therefore $-2.069 = -t_{0.025} = t_{0.975}$

\[ k = t_{0.01} = 2.5 \quad (v = 23) \]

b) $P(-k < T < k) = 0.9$

\[ k = t_{0.05} = 1.714 \quad (v = 23) \]