

INTRODUCTORY MATHEMATICAL STATISTICS
(STAT2001/6039)

Tutorial 2

Problem 1

Two contracts are assigned randomly and independently to three firms. (A firm may get both.)

Find the probability that:

- (a) Firm 1 gets both contracts
- (b) Firm 1 gets a contract, given that both contracts don't go to the same firm
- (c) Firm 1 gets Contract 1, given that it does not get Contract 2.

Problem 2

A crate of bolts is being inspected for defectives. Suppose that in one box with 20 bolts, four are defective. Two bolts are randomly selected from this box.

Find the probability that:

- (a) both are nondefective
- (b) at least one is nondefective
- (c) both are nondefective, given that at least one is nondefective.

Problem 3

An electric pump has three components. The pump will operate only if at least one of the components is functional. Suppose that a component breaks down with probability $1/10$ whenever the pump is turned on, and that the three components function independently of one another. Let A be the event that the pump will operate when turned on.

Find:

- (a) $P(A)$
- (b) the probability that Component 1 has failed, given that the pump is operating.

Problem 4

An accident victim will die unless she receives in the next ten minutes an amount of Type A Rh+ blood, which can be supplied by a donor. It requires two minutes to 'type' a prospective donor's blood, and two minutes to complete the transfer of blood. A large number of untyped donors are available, and 40% of them have Type A Rh+ blood.

What is the probability that the accident victim can be saved if only one blood-typing kit is available?