

Problem 79

2 components (s and t)

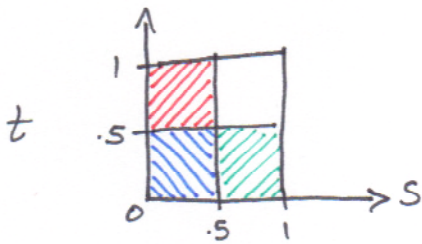
Device fails if either component fails

3 Possibilities:

- 1) s fails, t does not
- 2) t fails, s does not
- 3) Both s and t fail

$f(s, t)$ defined on $0 < s < 1$
 $0 < t < 1$

$P(\text{device fails during first half hour of operation})$



- 1) s fails within .5 hours, t does not
- 2) t fails within .5 hours, s does not
- 3) Both s and t fail within .5 hours

The integrals for choice \boxed{E} are the only ones which represent the shaded area in the graph above.

$$\int_0^{.5} \int_{.5}^1 f(s, t) \cdot ds \cdot dt + \int_0^1 \int_0^{.5} f(s, t) \cdot ds \cdot dt$$