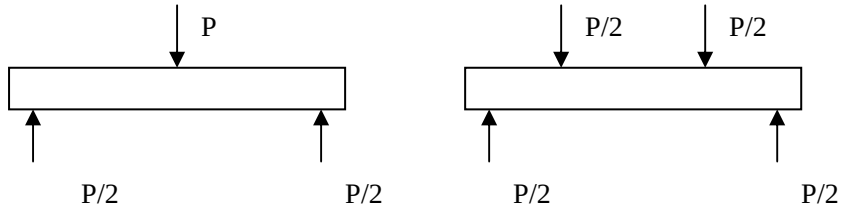
Solutions of ME 355 Home Work No. 2

1. 4A-6

The three terms refer to the same property.

It is the stress in the outer fiber of a specimen loaded in three- or four-point bending.



2. 4A-11

Temperature in Kelvin divided by melting point in Kelvin (or: T/T_m)

3. 4A-15

Adhesion is the force required to separate two bodies that had been in contact.

4. 4B-3

Possible reasons:

(a) Micro cracks in the ceramic
(b) Surface roughness created during specimen preparation
(c) Cracks induced during specimen preparation
(d) Improper alignment in test machine
(e) Bending stresses imposed by test grips

5. 4B-12

No. Compressive stresses do little damage and accumulation of damage would be insufficient at this stress level.

6. 4B-14

No. The initial slope of the force-extension curve recorded from the crosshead of the machine includes elastic deformation of the machine.

7. 4C-4 From table 8-2 and 8-3

	T_m (C)	T_m (K)	$0.5T_m$ (C)	$0.5T_m$ (K)
Zn	419	692	73	346
Cu	1083	1356	405	678
Ni	1455	1728	591	864

Zn will creep at 200 C; Cu and Ni will not.

8. 4C-9 From Eq. (4-11a)

σ_{fr} is propotional to $(r_c/a)^{1/2}$. 0.1/2-0.05/1; hence, they are equal in their effect.