

12 Nm Torque

$$(F_t)(r) = (F_t)(0.1) = 12$$

$$\underline{\underline{F_t = 120\text{N}}}$$

friction $F_t = (\text{coeff})(F_n)$

$$120 = 0.6 F_n$$

$$\underline{\underline{F_n = 200\text{N}}}$$

Loading on shaft

① Torque 12 Nm CONSTANT

② Axial load 200 N constant

③ Bending Moment occurs in two planes.

$$\sqrt{\left[\underset{200}{(F_n)(0.1)} \right]^2 + \left[\underset{120}{(F_t)(0.05)} \right]^2}$$

$$= 20.88 \text{ Nm}$$

need stress concentration factors.

look up K_t 3 times and q also

	<u>Torsion</u>
	$K_t = 1.10$
	$q = 0.93$
K_t	<hr/>
	1.09

	<u>Axial</u>
	$K_t = 1.28$
	$q = 0.91$
	<hr/>
	1.25

	<u>Bending</u>
	$K_t = 1.28$
	$q = 0.91$
	<hr/>
	1.25

Remember $K_f = 1 + q(K_t - 1)$