

Practice problems

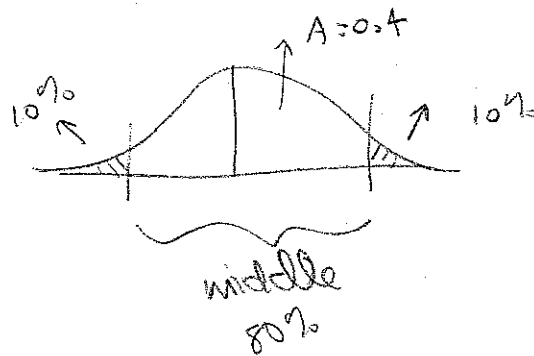
1.



$$\mu = 0.7 \text{ mm}$$

$$\sigma = 0.05 \text{ mm}$$

middle 80% \Rightarrow use normal distribution table...



ME PE book, p. A-12, Appendix 11.A
areas under std normal curve

$$\text{find } z(A=0.4) = 1.282$$

$$\text{use } z = \frac{x - \mu}{\sigma} \leftarrow \text{mean } \mu$$

\downarrow std dev

$$x_{hi} = \mu + z\sigma = 0.7 + 1.282(0.05) = 0.7641 \text{ mm}$$

$$x_{lo} = \mu - z\sigma = 0.7 - 1.282(0.05) = 0.6359 \text{ mm}$$

2. $80\% \text{ mcwb} = M$

$$M = \frac{m}{1-m} \quad (\text{slide 36, notes})$$

$$M = \frac{0.8}{1-0.8} = 4$$

3.

$$H = \alpha M$$

↑ factor ↓ height of grain on wall

Use EP545 p. 780 slides

get α from table 1, 1st need \angle of repose (β)

section 5.6 $\Rightarrow \beta = \text{internal } \angle \text{ of friction } (\phi)$

Table 2 \Rightarrow soybeans, $\phi = 29^\circ$

Table 1 \Rightarrow interpolate α

	28	29	30	
α	1.39	1.42	1.44	$\ominus \rightarrow$ assume 1.44
	1.44	1.47	1.5	

interp $\Rightarrow 1.45$

$$H = 1.45 \left(\frac{1}{3} \right) = 4.35 \text{ m}$$

4. Effective grain size: defn

p 35-3 CE manual, in soil particle distributions, the diameter at which 10% of the particles are finer (smaller) in the distribution

5. Look @ 10% interest table

time that $F = 2P$ or $\frac{F}{P} = 2$

look @ $\frac{F}{P}$ column \rightarrow interpolate :

$$n = 7$$

$$n = ?$$

$$n = 8$$

$$\frac{F}{P}$$

$$1.9487$$

$$\rightarrow 2 \leftarrow$$

$$2.1436$$

or ME PE p 69-8

Table 69.2

$i = 10 \Rightarrow$ doubling time = 7.27 periods

since $i = i_e$, 7.27 = 7.27 yrs

$$\frac{? - 7}{8 - 7} = \frac{2 - 1.9487}{2.1436 - 1.9487}$$

$$? - 7 = 0.2632$$

$$? = 7.2632$$