

iter	v	Σ_a
14	304.07	$2.7727e^{-10}$
15	304.07	$4.0679e^{-11}$
16	304.07	$5.9635e^{-12}$

Converging at iter = 7; $v = 304.07$

T_{core}

$$\bar{T}_D = \frac{0.3v^2}{500 + (1.2v)^3} - 0.02v$$

If $v = 304.07$

Recall $\bar{T}_D = 9.8 \times 3.5 = 34.3$

substituting $v = 304.07$

$$\bar{T}_D = \frac{0.3 \times (304.07)^2}{500 + (1.2 \times 304.07)^3} - 0.02(304.07)$$

$$\bar{T}_D = 40.38195931 - 6.0814$$

$$\bar{T}_D = 34.3 //$$

Dung Damian Weng
 17/eng06/022
 Mechanical Engineering

Command window

Clear

clc

Format short

$$v = 0.5$$

$$m = 3.5$$

$$g = 9.8$$

$$F = m * g$$

$$v = \text{sqrt}(((F + (0.02 * v))^2 * (\log(v)^3)) + (10 * v) + 17100) / 0.3);$$

for i = 1:10

iter(i+1) = v

$$v(i+1) = \text{sqrt}(((F + (0.02 * v(i)))^2 * (\log(v(i))^3)) + (10 * v(i)) + 17100) / 0.3);$$

$$\text{Sa}(i+1) = \text{abs}((v(i+1) - v(i)) / v(i+1)) * 100);$$

if Sa(i+1) <= 1E-11

break

end

end

table = table(Iter, v, Sa)

Output

iter	v	Sa	iter	v	Sa
0	0.5	0	1	304.07	0.0002941
1	239.05	79.791	8	304.07	0.00018981
2	294.19	48.786	9	304.07	2.1842e-05
3	302.61	2.1824	10	304.07	4.0838e-06
4	303.88	0.40992	11	304.07	8.7865e-08
5	304.04	0.06044	12	304.07	1.2885e-08
6	304.06	0.0085222	13	304.07	1.8204e-09