

14/05/20 - 1pm

VEHICLE TECHNOLOGY M4X00394

ANDREW WHITE 1803827

page 3 of 8

$$(3)(i) \quad \frac{1}{k} = \frac{1}{k_1} + \frac{1}{k_2}$$

$$\frac{1}{k} = \frac{1}{13000} + \frac{1}{28000}$$

$$\frac{1}{k} = \frac{41}{364000}$$

$$\therefore k = 8878 \text{ N/m}$$

$$\therefore \text{overall spring rate} = 8878 \times 2 = \underline{\underline{17756 \text{ N/m}}}$$

$$(ii) \quad f_n = \frac{1}{2\pi} \sqrt{\frac{k}{m}} = \frac{1}{2\pi} \sqrt{\frac{17756}{200}}$$
$$= \underline{\underline{1.50 \text{ Hz}}}$$

(iii) This natural frequency suggests that this suspension system would be considered to give a comfortable ride such as in a modern saloon car. It would not be suitable for an off road vehicle whose natural frequency would be required to be between 2-2.5 Hz.