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CMPT 434 ~ ASSIGNMENT 2

A2. $\tau = \frac{d}{s}$ $\quad s = \frac{2}{3}C = 2\times10^8$ m/s

$t = \frac{f}{r}$ $\quad f$ = frame size, r = data rate

a) $d = 50m \quad r = 100\times10^6$ bps $\quad f = 2\times10^3$ bits

$\tau = \frac{50m}{2\times10^8 m/s} = 2.5\times10^{-7}$ s

$t = \frac{2\times10^3 \text{ bits}}{100\times10^6 \text{ bps}} = 2\times10^{-5}$ s

$\frac{\tau}{t} = 0.013$

b) $d = 5\times10^3 m \quad r = 100\times10^6$ bps $\quad f = 2\times10^3$ bits

$\tau = \frac{5\times10^3 m}{2\times10^8 m/s} = 2.5\times10^{-5}$ s

$t = \frac{2\times10^3 \text{ bits}}{100\times10^6 \text{ bps}} = 2\times10^{-5}$ s

$\frac{\tau}{t} = 1.3$

c) $d = 200m \quad r = 10\times10^9$ bps $\quad f = 20\times10^3$ bits

$\tau = \frac{200m}{2\times10^8 m/s} = 1\times10^{-6}$ s

$$t = \frac{20 \times 10^3 \text{ bits}}{10 \times 10^9 \text{ bps}} = 2 \times 10^{-6} \text{ s}$$

$$\frac{\tau}{t} = 0.5$$