

# Viewing Distance

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## Exercise

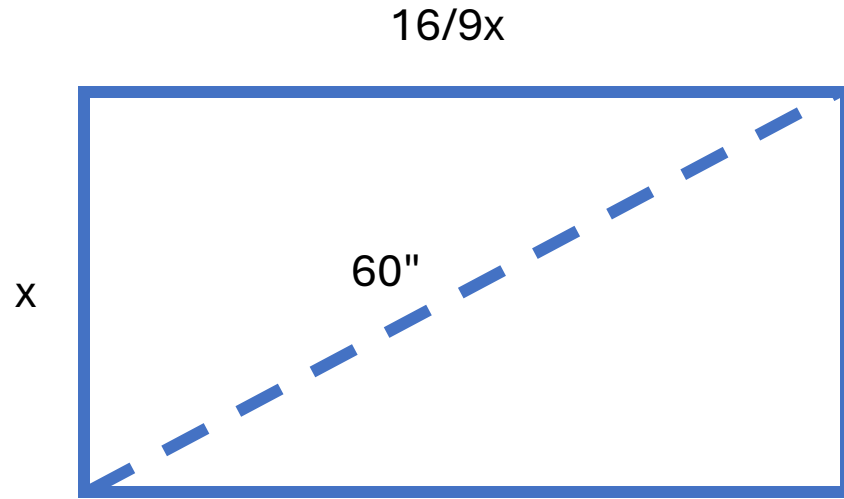
Multimedia Technology,  
Tutorial 3, section 2

# Viewing Distance

Suppose there is a 60-inch television (diagonal) that supports 2K resolution (2560 x 1440) with an aspect ratio of 16:9 and square pixels.

Calculate the maximum viewing distance (in inches) beyond which the viewer will notice a loss of detail?

# Viewing Distance – Pythagorean Theorem



$$\begin{aligned}x^2 + (16/9 * x^2)^2 &= 60^2 \Leftrightarrow (1 + 16^2/9^2) x^2 = 60^2 \\ \Leftrightarrow 4.16 x^2 &= 60^2 \Leftrightarrow x = 60 / \sqrt{4.16} = 60 / 2.04 \\ \Leftrightarrow x &= 29.42''\end{aligned}$$

$$\text{Viewing Distance} = 2000 * \underbrace{(29.42 / 1440)}_{\text{Pixel size}} = 40.86''$$

(Human vision) Limit : 2000 \* pixel size  
(see Lecture slides)