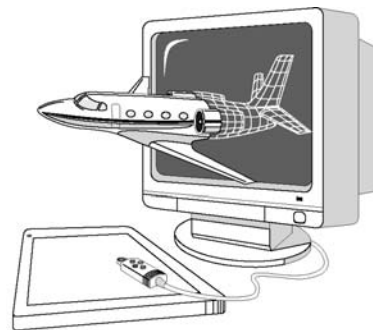


Real-Life Career Activity

Computer Game Artist

Computer game artists must not only be good artists, but also know how to use computer graphics applications. As computer technology continues to develop, artists must constantly learn to use new applications and other technology to help them draw more complex graphics with less effort. Computer game artists must be able to accurately follow the plans of game designers while working under tight deadlines in what is often a hectic environment.



Suppose an artist draws a window with corners at $(1, 1)$, $(5, 1)$, $(1, 5)$, and $(5, 5)$. The artist wants to show how the window will appear when a character in the game moves toward the window. The window is dilated with a scale factor of 2. To find the locations of the new corners of the window, the artist multiplies each corner coordinate by 2.

$$(1, 1) \rightarrow (2 \cdot 1, 2 \cdot 1) \rightarrow (2, 2)$$

$$(5, 1) \rightarrow (2 \cdot 5, 2 \cdot 1) \rightarrow (10, 2)$$

$$(1, 5) \rightarrow (2 \cdot 1, 2 \cdot 5) \rightarrow (2, 10)$$

$$(5, 5) \rightarrow (2 \cdot 5, 2 \cdot 5) \rightarrow (10, 10)$$

The new corners of the window are at $(2, 2)$, $(10, 2)$, $(2, 10)$, and $(10, 10)$.

An artist draws a door with corners at $(1, 2)$, $(9, 2)$, $(1, 8)$, and $(9, 8)$. The artist wants to show how the door will appear when a character in the game moves toward or away from the door.

1. Calculate the locations of the new corners of the door for a scale factor of $\frac{1}{2}$.

2. Calculate the locations of the new corners of the door for a scale factor of 2.

3. The new corners of the door are at $\left(\frac{1}{4}, \frac{1}{2}\right)$; $\left(2\frac{1}{4}, \frac{1}{2}\right)$; $\left(\frac{1}{4}, 2\right)$; and $\left(2\frac{1}{4}, 2\right)$.

What is the scale factor?