3. As would be \( \frac{\text{52}}{\text{20}} \)
   so the mirror would be at \( (\frac{\text{52}}{2}, \text{0}) \)

6. \( \frac{8}{12} = \frac{2}{3} = \frac{x}{27-x} \Rightarrow 54-3x = 3x \Rightarrow \frac{54}{5} = x \approx 10.8 \)

7. The mirror would move right. As the window gets closer to \((0, \text{12})\), the \( \Delta \) would get closer to \( \frac{\text{32}}{4} \), so \( Am \) would be getting larger

8. \( \frac{9}{12} = \frac{3}{4} = \frac{x}{27-x} \Rightarrow 81-3x = 4x \Rightarrow \frac{9}{4} = x \)

\( 10.8 + \frac{9}{4} = \frac{27}{2} \approx 1.77 \text{ ft right!} \)
10. \[ \frac{8}{14} = \frac{4}{7} = \frac{x}{27-x} \]
\[ 108 - 4x = 7x \]
\[ \frac{108}{7} = x \]
\[ x = 15.42 \]

11. \[ \frac{10}{14} = \frac{5}{7} = \frac{x}{18-x} \]
\[ 90 - 5x = 7x \]
\[ x = \frac{90}{12} = \frac{15}{2} = 7.5 \]
\[ \text{Width} = 7.5 - 6.55 = 0.95 \text{ ft} \]

12. \[ \text{Width of mirror} = 11.25 - 9.52 = 1.73 \text{ ft} \]

Narrower mirror?

Reflection
Comfy chair (cont’d)

14. Wider! →

Construct a diagram showing the reflection of the chair in the mirror.

15. Develop a formula for x!

\[
\frac{w}{y} = \frac{x}{27-x}
\]

\[
27w - xw = yx
\]

\[
x = \frac{27w}{w+y}
\]

The mirror must have max width:

\[
13.5 - 9 = 4.5 \text{ ft}
\]

now, when \( w = 8 \) and \( y = 10 \):

\[
x = \frac{27(8)}{8+10} = 12
\]

\[
w = 10 \quad y = 10
\]

\[
x = \frac{27(10)}{20} = \frac{27}{2} = 13.5
\]

\[
w = 8, y = 16
\]

\[
x = \frac{27(8)}{24} = 9
\]

\[
w = 10, y = 16
\]

\[
x = \frac{27(10)}{26} = \frac{135}{13} = 10.4
\]
\( \frac{8}{y} = \frac{11}{16} \)

2nd mirror is @ \((27, \frac{128}{3})\)

\[
\begin{align*}
\frac{128}{8} &= \frac{11.636}{16-11.636} = \frac{16}{27-x} = \frac{128}{4x} = \frac{8}{3} = \frac{16}{27-x} \\
216 - 8x &= 48 \\
168 &= 8x \\
21 &= x \\
\text{Comfy chair at } (21, 16)
\end{align*}
\]