12.10 (b) \( f(x) = \frac{ax+b}{x+d} \) with \( f(0) = 10, f(5) = 4, f(20) = 3 \).

**PLUGGING IN INFO**

1. \( f(0) = 10 \Rightarrow 10 = \frac{a(0)+b}{(0)+d} \Rightarrow b = 10d \)
2. \( f(5) = 4 \Rightarrow 4 = \frac{a(5)+b}{(5)+d} \Rightarrow 20+4d = 5a+b \)
3. \( f(20) = 3 \Rightarrow 3 = \frac{a(20)+b}{(20)+d} \Rightarrow 60+3d = 20a+b \)

**COMBINING AND SOLVING**

Using 1 in 2 and 3 gives:

2. \( 20+4d = 5a+10d \Rightarrow 20 = 5a+6d \)
3. \( 60+3d = 20a+10d \Rightarrow 60 = 20a+7d \)

Solving for \( a \) in 2 gives: \( 5a = 20-6d \Rightarrow a = \frac{20-6d}{5} \)

Using this in 3 gives:

\[
\begin{align*}
\text{LHS} &= 60 = 4(20-6d) + 7d \\
\text{RHS} &= 60 = 80 - 24d + 7d \\
\Rightarrow -20 &= -17d \\
\Rightarrow d &= \frac{20}{17} \approx 1.17647058824
\end{align*}
\]

**PLUGGING THIS VALUE IN ABOVE** gives:

\[
\begin{align*}
a &= \frac{20-6d}{5} = 4 - \frac{6}{5} \left( \frac{20}{17} \right) = \frac{44}{17} \approx 2.58823529 \approx 2.6 \quad \text{(in \[ Ch. 17 \]
\[ Ch. 16 \]
\[ Ch. 15 \]
\[ Ch. 14 \]
\[ Ch. 13 \]
\[ Ch. 12 \]
\[ Ch. 11 \]
\[ Ch. 10 \]
\[ Ch. 9 \]
\[ Ch. 8 \]
\[ Ch. 7 \]
\[ Ch. 6 \]
\[ Ch. 5 \]
\[ Ch. 4 \]
\[ Ch. 3 \]
\[ Ch. 2 \]
\[ Ch. 1 \]
\[ Ch. 0 \]
\[
\begin{align*}
b &= 10d = 10 \left( \frac{20}{17} \right) = \frac{200}{17} \approx 11.7647058824
\end{align*}
\]

Thus, \( f(x) = \frac{44x + 200}{17x + 20} \) **ALL CORRECT**

Checking work:

\[
\begin{align*}
f(0) &= \frac{1200}{20} = 60 \\
f(5) &= \frac{445 + 200}{17(5) + 20} = \frac{445}{75} = \frac{29}{5} = 4.35 \\
f(20) &= \frac{1200 + 200}{19(20) + 20} = \frac{1400}{390} = \frac{10}{3} = 3.33
\end{align*}
\]
Ch. 13 Hints

On 13.3, the area of an object of the form

is equal to the area of the large wedge minus the area of the smaller wedge.

On 13.5, if \( \theta \) is small, the length of the chord is close to the length of arc. So they are asking you to compute the arc length with the given radius and angle.

On 13.8, set up an equation involving arc length and an equation involving area of a wedge. Combine the equations and solve.