Find DC and EC. \( \Delta \text{EHG} \) is similar to \( \Delta \text{CDG} \)
\( \Delta \text{EFK} \) is similar to \( \Delta \text{CDK} \)

\[
\frac{CE + 5}{5} = \frac{CD}{15\frac{1}{4}} \quad \text{and} \quad \frac{CE + \frac{40}{3}}{\frac{40}{3}} = \frac{CD}{10}
\]

Let \( x = CE, \ y = CD \) so \( 15.1(x + 5) = 200y \) and \( 3x + 40 = 4y \)

\[
151x + 151.5 = 150x + 50.40 \quad \Rightarrow \quad x = 2000 - 75.5
\]

\[
[EC = 1245 \text{ ft}]
\]

and then \( y = (3 \cdot 1245 + 40) / 4 = 943.75 \Rightarrow [CD = 943.75 \text{ ft}]
\]

Katz 7.23

\( y^4 = 279,841 \). Solve by Gutmans procedure.

Note \( 20^4 < 279,841 < 30^4 \), so \( y = 20 + x \) with \( 0 \leq x < 10 \)

Use synthetic division to write the equation in terms of \( x \)

\[
\begin{array}{c|cccc}
20 & 1 & 0 & 0 & 0 & -279,841 \\
20 & 20 & 800 & 16,000 & \hline
20 & 1 & 20 & 400 & 800 & 119,841
\end{array}
\]

so \( x \) satisfies

\[
0 = x^4 + 80x^3 + 2400x^2 + 33000x - 119,841
\]

and \( x = 3 \) works. Thus the original equation has \( y = 23 \) as a solution.

These equalities, and

\[
-119841 = \binom{4}{3} \cdot 20^4 - 279,841,
\]

give the relationship with Pascal's triangle (via the binomial expansion of

\[
(x + 20)^4 = 279,841.
\]