

Exercise 31

Use algebra to find the point at which the line $f(x) = \frac{7}{4}x + \frac{457}{60}$ intersects the line $g(x) = \frac{4}{3}x + \frac{31}{5}$.

Solution

At the point of intersection, the two functions are equal.

$$\begin{aligned}f(x) &= g(x) \\ \frac{7}{4}x + \frac{457}{60} &= \frac{4}{3}x + \frac{31}{5}\end{aligned}$$

Solve for x .

$$\begin{aligned}\frac{7}{4}x - \frac{4}{3}x &= \frac{31}{5} - \frac{457}{60} \\ \frac{5}{12}x &= -\frac{17}{12} \\ x &= -\frac{17}{5}\end{aligned}$$

Now plug this value of x into either of the functions to get the corresponding y -value.

$$f\left(-\frac{17}{5}\right) = \frac{7}{4}\left(-\frac{17}{5}\right) + \frac{457}{60} = \frac{5}{3}$$

Therefore, the point of intersection is $\left(-\frac{17}{5}, \frac{5}{3}\right)$.

