

Find the LCD

24. $\frac{3}{x^2 - 25}$ and $\frac{x}{x^2 - 10x + 25}$

$$\text{LCD} = (x+5)(x-5)(x-5)$$

The diagram shows the factorization of the denominators. The first denominator, $x^2 - 25$, is factored into $(x+5)(x-5)$ using a blue bracket. The second denominator, $x^2 - 10x + 25$, is factored into $(x-5)(x-5)$ using a green bracket. The LCD is then formed by taking the highest power of each factor: one $(x+5)$ from the first factorization and two $(x-5)$ s from the second factorization, resulting in $(x+5)(x-5)(x-5)$.

$$\begin{array}{r} 1 \\ \hline 8 \\ + \end{array} \frac{1}{6}$$

$$\begin{array}{r} 1 \\ \hline 2 \cdot 2 \cdot 2 \\ + \end{array} \frac{1}{2 \cdot 3}$$

$$\overline{2 \cdot 22 \cdot 3}$$

$$\frac{2x}{2x \cdot 6x^2} + \frac{1}{4x^3 \cdot 3}$$

$2 \cdot 3 \cdot x \cdot x$ $2 \cdot 2 \cdot x \cdot x \cdot x$

$$\frac{6x}{2 \cdot 3 \cdot 2x} + \frac{3}{2 \cdot 3 \cdot 2x^3}$$

$$\frac{6x+3}{12x^3} \rightarrow \frac{3(2x+1)}{3 \cdot 4x^3} \rightarrow \boxed{\frac{2x+1}{4x^3}}$$

$$39. \frac{3y+7}{y^2-5y+6} - \frac{3}{y-3}$$

2y+9 2

① factor denom.

② Find LCD

$$\frac{3y+7}{(y-3)(y-2)} - \frac{3(y+2)}{y-3(y-2)}$$

③ write new denominators

④ look back and
see what fractions
are missing

$$\frac{3y+7}{(y-3)(y-2)} + \frac{3y+6}{(y-3)(y-2)}$$

⑤ Simplify numer.

⑥ add numerators

⑦ check to
see if.
fraction
simplifies

$$\frac{13}{(y-3)(y-2)}$$

add or subtract

$$\frac{x^2 - 4}{x^2 + 9x + 18} - \frac{x - 4}{x + 6}$$

$$\frac{x^2 - 4}{(x+6)(x+3)} - \frac{(x-4)(x+3)}{x+6(x+3)}$$

$$\frac{x^2 - 4}{(x+6)(x+3)} + \frac{-x^2 + x + 12}{(x+6)(x+3)}$$

$$\frac{(x+6)1}{(x+6)(x+3)} \rightarrow \frac{1}{x+3}$$

$$\frac{x+4}{x^2-x-2} - \frac{2x+3}{x^2+2x-8}$$

$$\frac{(x+4)(x+4)}{(x+1)(x-2)(x+4)} - \frac{(2x+3)(x+1)}{(x+4)(x-2)(x+1)}$$

$$\frac{x^2+8x+16}{(x+1)(x-2)(x+4)} + \frac{-2x^2+5x+3}{(x+1)(x-2)(x+4)}$$

$$\frac{-x^2+3x+13}{(x+1)(x-2)(x+4)}$$

$$\begin{array}{r} \underline{2x+1} \\ x^2 - 7x + 6 \\ \hline - \quad \underline{x+3} \\ x^2 - 5x - 6 \end{array}$$

$$\begin{array}{c} \frac{(2x+1)(x+1)}{(x-6)(x-1)(x+1)} - \frac{(x+3)(x-1)}{(x-6)(x+1)(x-1)} \\ \frac{2x^2 + 3x + 1}{(x-6)(x-1)(x+1)} + \frac{-x + 2x + 3}{(x-6)(x-1)(x+1)} \end{array}$$

$$\frac{x^2 + x + 4}{(x-6)(x-1)(x+1)}$$

$$\frac{9x}{x^2-y^2} - \frac{10}{y-x} \cdot \frac{(-1)}{(-1)}$$

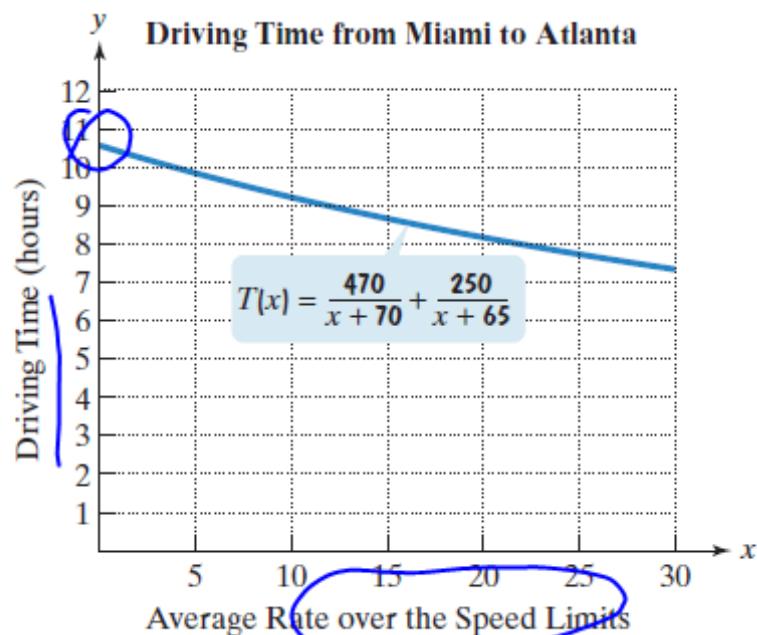
$$\frac{9x}{(x+y)(x-y)} + \frac{+10}{(x-y)(x+y)} \cdot \frac{(x+y)}{(x+y)}$$

$$\frac{9x + 10x + 10y}{(x+y)(x-y)} \rightarrow \frac{19x + 10y}{(x+y)(x-y)}$$

$$\frac{y-7}{y^2-16} - \frac{(7-y)(-1)}{16-y^2(-1)}$$

$$\frac{y-7}{y^2-16} + \frac{y+7}{y^2-16} \rightarrow \frac{0}{y^2-16} = \textcircled{0}$$

The graph of T is shown in the figure. Use the function's equation to solve Exercises 77–82.



7. Find and interpret $T(0)$. Round to the nearest hour. Identify your solution as a point on the graph.

$$\begin{aligned} X \\ T(x) \end{aligned}$$

$$T(0) = \frac{470}{70} + \frac{250}{65}$$

$$T(0) = 10.6$$

Going the speed limit, it would take ~ 10.6 hrs

$$\frac{y^2}{y^2 - 9} + \frac{9 - 6y}{y^2 - 9} = \frac{y^2 - 6y + 9}{y^2 - 9}$$
$$= \frac{(y+3)(y-3)}{(y+3)(y-3)}$$
$$= \cancel{\frac{y-3}{y+3}}$$