

Math 0093, Fall 2000: Solutions to Quiz 3

1. If b is the base of the triangle, then the height is $2b + 4$ and the area is $\frac{1}{2}b(2b + 4) = 35$.

$$\frac{1}{2}b(2b + 4) = 35$$

$$b(b + 2) = 35$$

$$b^2 + 2b - 35 = 0$$

$$(b + 7)(b - 5) = 0$$

Either $b = 5$ or $b = -7$. Since b is a length, it can not be negative, and so $b = 5$.

The height of the triangle is $2 \cdot 5 + 4 = 14\text{cm}$.

2. (a)

$$\begin{aligned}\frac{x^2 - 5x - 14}{x^2 - 4} &= \frac{(x - 7)(x + 2)}{(x + 2)(x - 2)} \\ &= \frac{x - 7}{x + 2}\end{aligned}$$

- (b)

$$\begin{aligned}\frac{x - 1 + \frac{2}{x - 4}}{x + 3 + \frac{6}{x - 4}} &= \frac{x - 1 + \frac{2}{x - 4}}{x + 3 + \frac{6}{x - 4}} \cdot \frac{x - 4}{x - 4} \\ &= \frac{(x - 1)(x - 4) + 2}{(x + 3)(x - 4) + 6} \\ &= \frac{x^2 - 5x + 4 + 2}{x^2 - x - 12 + 6} \\ &= \frac{x^2 - 5x + 6}{x^2 - x - 6} \\ &= \frac{(x - 2)(x - 3)}{(x - 3)(x + 2)} \\ &= \frac{x - 2}{x + 2}\end{aligned}$$

- 3.

$$\begin{aligned}\frac{1}{x - 2} + 1 &= \frac{x}{x - 4} \\ (x - 2)(x - 4)\left[\frac{1}{x - 2} + 1\right] &= \frac{x}{x - 4}(x - 2)(x - 4) \\ x - 4 + (x - 2)(x - 4) &= x(x - 2) \\ x - 4 + x^2 - 6x + 8 &= x^2 - 2x \\ x^2 - 5x + 4 &= x^2 - 2x \\ -3x + 4 &= 0 \\ x &= \frac{4}{3}\end{aligned}$$