

## Algebra and Calculus: Homework 2 Solutions

### Section 1.5: 26,70,80,94

- *Q26*: Solve:  $\frac{2x-1}{x+2} = \frac{4}{5}$ :

$$\begin{aligned}\frac{2x-1}{x+2} &= \frac{4}{5} \\ 5(2x-1) &= 4(x+2) \\ 10x-5 &= 4x+8 \\ 6x &= 13 \\ x &= \frac{13}{6}\end{aligned}$$

- *Q70*: Find all real solutions:  $3x^2 + 7x + 4 = 0$ .

$$\begin{aligned}3x^2 + 7x + 4 &= 0 \\ (3x+4)(x+1) &= \\ 3x+4 = 0 &\implies x = -\frac{4}{3} \\ x+1 = 0 &\implies x = -1\end{aligned}$$

- *Q80*: Find all real solutions:  $25x^2 + 70x + 49 = 0$ .

$$\begin{aligned}25x^2 + 70x + 49 &= 0 \\ (5x+7)^2 &= 0 \\ 5x+7 = 0 &\implies x = -\frac{7}{5}\end{aligned}$$

- *Q94*: Find all real solutions:  $\sqrt{8x-1} = 3$ .

$$\begin{aligned}\sqrt{8x-1} &= 3 \\ 8x-1 &= 9 \\ 8x &= 10 \\ x &= \frac{10}{8} = \frac{5}{4}\end{aligned}$$

### Section 1.7: 42

- *Q42*: A rectangular bedroom is 7 ft longer than it is wide. Its area is  $228 \text{ ft}^2$ . What is the width of the room?

We need to translate the word problem into a system of two equations.

- The area is 228  $ft \implies A = lw = 228$ .
- The room is seven ft longer than it is wide  $\implies l = w + 7$ .

Now we can solve:

$$\begin{aligned}lw &= 228 \\(w + 7)w &= 228 \\w^2 + 7w - 228 &= 0 \\(w + 19)(w - 12) &= 0 \\w &= \{\cancel{-19}, 12\}\end{aligned}$$

(we remove the negative value because we clearly cannot have a negative width). So the width of the room is 12 ft.