Systems of Equations – Answer Key

1) Commuter Rail Tickets

Let x = the number of 8-ride tickets. Round-trip tickets = 12x.
2(12x) + 8x = 960 → 32x = 960 → x = 30.
Round-trip tickets: 12(30) = 360.

Answer: 360 round-trip tickets

2) Movie Watching

Let x = the number of 2-hour documentaries. Comedy movies = 3x.
1.5(3x) + 2x = 26 → 6.5x = 26 → x = 4.
Comedy movie time: 3(4)(1.5) = 18 hours.

Answer: 18 hours watching comedy movies

3) Calories in an Orange and a Peach

Let p = Calories in a peach. Orange = p + 14.
7p = 5(p + 14) → 7p = 5p + 70 → 2p = 70 → p = 35.
Orange = 35 + 14 = 49.

Answer: Orange: 49 Calories; Peach: 35 Calories

4) Calories in Celery and a Carrot

Let s = Calories in a celery stalk. Carrot = s + 11.
4(s + 11) + 6s = 150 → 10s + 44 = 150 → 10s = 106 → s = 10.6.
Carrot = 10.6 + 11 = 21.6.

Answer: Celery: 10.6 Calories; Carrot: 21.6 Calories

5) Red and Blue Rectangles

Let w = the red rectangle's width. Red length = w + 12.
Blue width = w + 4; blue length = w + 9.
2[(w + 4) + (w + 9)] = 66 → 4w + 26 = 66 → w = 10.
Red rectangle: width 10 cm, length 22 cm. Blue rectangle: width 14 cm, length 19 cm.

Answer: Red: 10 cm × 22 cm; Blue: 14 cm × 19 cm

6) Two Rectangles

Let w = the first rectangle's width. Its length = 2w.
Second rectangle: width = w - 2; length = 2w + 10.
2[(w - 2) + (2w + 10)] = 100 → 6w + 16 = 100 → w = 14.
First rectangle: width 14 cm, length 28 cm. Second rectangle: width 12 cm, length 38 cm.

Answer: First: 14 cm × 28 cm; Second: 12 cm × 38 cm