Chapter 2 Gifted and Enrichment Answers

1. Look at each watering pattern to find the first day that they all water.
Toby: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 30, …
Logan: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, …
Jordan: 10, 20, 30, …
They first water on the same day on the 30th day.
They will water on the same day on days 30, 60, 90, 120, 150, 180, 210, 240, 270, 300, 330, 360, for a total of 12 times in a year (365 days).
This assumes that they will water all year round (perhaps indoor gardens).

2. In 10 s the helicopter will have flown 10 s × 5 m/s or 50 m. So, the seedlings land 50 m behind the helicopter.

3. a) 1 person would take 3 times as long, 3 × 2 or 6 days.

b) 1 person would take 5 times as long, 5 × 6 or 30 days.

c) 1 person would take 25 times as long, $25 \times \frac{1}{2}$ or $12\frac{1}{2}$ h.

d) 1 person would take 6 times as long, 6 × 4 or 24 min.

4. a) Colour A: red:blue = 1:1
Colour B: red:blue = 1:2
Colour C: (Colour A red + Colour B red):(Colour A blue + Colour B blue)
= (1 + 1):(1 + 2) = 2:3

b) Colour C is 2 out of 5 parts red or $\frac{2}{5}$ red.

c) Colour A is red:blue in ratio 1:1, thus 1 out of 2 parts is red, so Colour A is $\frac{1}{2}$ red is correct. Similarly, Colour B is red:blue in ratio 1:2, thus Colour B is 1 out of 3 parts red, so Colour B is $\frac{1}{3}$ red is also correct.

Colour D

$$= \left(\frac{1}{2} \times 2 \text{ L red from Colour A} + \frac{1}{3} \times 2 \text{ L red from Colour B}\right) \text{ out of 4 L total}$$

$$= \left(1 + \frac{2}{3}\right) \text{out of 4}$$

$$= 1\frac{2}{3} \div 4$$

$$= \frac{5}{3} \times \frac{1}{4}$$

$$= \frac{5}{12}$$

Julian had the wrong fraction; Colour D is $\frac{5}{12}$ red as shown above.

d) Colour D

$$= \left(\frac{1}{2} \times 2 \text{ L red from Colour A} + \frac{1}{3} \times 2 \text{ L red from Colour B}\right) : \left(\frac{1}{2} \times 2 \text{ L blue from Colour A} + \frac{2}{3} \times 2 \text{ L blue from Colour B}\right)$$

$$= \left(1 + \frac{2}{3}\right) : \left(1 + \frac{4}{3}\right)$$

$$= \frac{5}{3} \div \frac{7}{3}$$

$$= \frac{5}{3} \times \frac{3}{7}$$

$$= \frac{5}{7}$$

Colour D is red:blue in the ratio 5:7.

5.

Gears Used	Ratio Used	Resulting Ratios
A	2:1	2:1
A	1:2	1:2
B	3:1	3:1
B	1:3	1:3
C	4:1	4:1
C	4:1	4:1
A, B	2:1, 3:1	(2 × 3):(1 × 1) or 6:1
A, B	1:2, 1:3	(1 × 1):(2 × 3) or 1:6
A, B	2:1, 1:3	(2 × 1):(1 × 3) or 2:3
A, B	1:2, 3:1	(1 × 3):(2 × 1) or 3:2
A, C	2:1, 4:1	(2 × 4):(1 × 1) or 8:1
A, C	1:2, 1:4	(1 × 1):(2 × 4) or 1:8
A, C	2:1, 1:4	(2 × 1):(1 × 4) or 2:4 or 1:2 (duplicate)
A, C	1:2, 4:1	(1 × 4):(2 × 1) or 4:2 or 2:1 (duplicate)
B, C	3:1, 4:1	(3 × 4):(1 × 1) or 12:1
B, C	1:3, 1:4	(1 × 1):(3 × 4) or 1:12
B, C	3:1, 1:4	(3 × 1):(1 × 4) or 3:4
B, C	1:3, 4:1	(1 × 4):(3 × 1) or 4:3
A, B, C	2:1, 3:1, 4:1	(2 × 3 × 4):(1 × 1 × 1) or 24:1
A, B, C	1:2, 1:3, 1:4	(1 × 1 × 1):(2 × 3 × 4) or 1:24
A, B, C	2:1, 1:3, 4:1	(2 × 1 × 4):(1 × 3 × 1) or 8:3
A, B, C	1:2, 3:1, 1:4	(1 × 3 × 1):(2 × 1 × 4) or 3:8
A, B, C	2:1, 3:1, 1:4	(2 × 3 × 1):(1 × 1 × 4) or 6:4 or 3:2 (duplicate)
A, B, C	1:2, 1:3, 4:1	(1 × 1 × 4):(2 × 3 × 1) or 4:6 or 2:3 (duplicate)
A, B, C	2:1, 1:3, 1:4	(2 × 1 × 1):(1 × 3 × 4) or 2:12 or 1:6 (duplicate)
A, B, C	1:2, 3:1, 4:1	(1 × 3 × 4):(2 × 1 × 1) or 12:2 or 6:1 (duplicate)

So, there are 20 different gear ratios possible.