

Exercise 1A

1 a

| A | B |
|----------------|-----------------|
| 244 | 125 |
| 122 | 250 |
| 61 | 500 |
| 30 | 1000 |
| 15 | 2000 |
| 7 | 4000 |
| 3 | 8000 |
| 1 | 16 000 |
| Total | 30 500 |

b

| A | B |
|---------------|----------------|
| 125 | 244 |
| 62 | 488 |
| 31 | 976 |
| 15 | 1952 |
| 7 | 3904 |
| 3 | 7808 |
| 1 | 15 616 |
| Total | 30 500 |

c

| A | B |
|----------------|-------------------|
| 256 | 123 |
| 128 | 246 |
| 64 | 492 |
| 32 | 984 |
| 16 | 1968 |
| 8 | 3936 |
| 4 | 7872 |
| 2 | 15 744 |
| 1 | 31 488 |
| Total | 31 488 |

2 a 1 $\frac{a}{b} = \frac{9}{4}$ $\frac{c}{d} = \frac{4}{3}$ $a = 9, b = 4, c = 4, d = 3$

2 $e = ad = 9 \times 3 = 27$

3 $f = bc = 4 \times 4 = 16$

4 answer is $\frac{27}{16}$

b It divides the first fraction by the second fraction.

3 a

| Instruction step | n | A | Print |
|------------------|---------------------------------|-----|-------|
| 1 | 1 | 1 | |
| 2 | | | 1 |
| 3 | | 4 | |
| 4 | 2 | | |
| 5 | $2 \leq 10$ go to step 2 | | |
| 2 | | | 4 |
| 3 | | 9 | |
| 4 | 3 | | |
| 5 | $3 \leq 10$ go to step 2 | | |
| 2 | | | 9 |
| 3 | | 16 | |
| 4 | 4 | | |
| 5 | $4 \leq 10$ go to step 2 | | |
| 2 | | | 16 |
| 3 | | 25 | |
| 4 | 5 | | |
| 5 | $5 \leq 10$ go to step 2 | | |
| 2 | | | 25 |
| 3 | | 36 | |
| 4 | 6 | | |
| 5 | $6 \leq 10$ go to step 2 | | |
| 2 | | | 36 |
| 3 | | 49 | |
| 4 | 7 | | |
| 5 | $7 \leq 10$ go to step 2 | | |
| 2 | | | 49 |
| 3 | | 64 | |
| 4 | 8 | | |
| 5 | $8 \leq 10$ go to step 2 | | |
| 2 | | | 64 |
| 3 | | 81 | |
| 4 | 9 | | |
| 5 | $9 \leq 10$ go to step 2 | | |
| 2 | | | 81 |
| 3 | | 100 | |
| 4 | 10 | | |
| 5 | $10 \leq 10$ go to step 2 | | |
| 2 | | | 100 |
| 3 | | 121 | |
| 4 | 11 | | |
| 5 | $11 \leq 10$ continue to step 6 | | |
| 6 | Stop | | |

Output 1, 4, 9, 16, 25, 36, 49, 64, 81, 100

b The algorithm produces the squares of the first 10 natural numbers.

4 a i

| Step | A | r | c | $ r - c $ | s | Print r |
|--------|-----|--------|--------|-----------|--------|--------------|
| 1 | 253 | 12 | | | | |
| 2 | | | 21.083 | | | |
| 3 | | | | 9.083 | | |
| 4 | | | | | 16.542 | |
| 5 | | 16.542 | | | | |
| 6 → 2 | | | 15.294 | | | |
| 3 | | | | 1.248 | | |
| 4 | | | | | 15.918 | |
| 5 | | 15.918 | | | | |
| 6 → 2 | | | 15.894 | | | |
| 3 | | | | 0.024 | | |
| 4 | | | | | 15.906 | |
| 5 | | 15.906 | | | | |
| 6 → 2 | | | 15.906 | | | |
| 3 → 7 | | | | 0 | | |
| 7 | | | | | | $r = 15.906$ |
| 8 stop | | | | | | |

ii

| Step | A | r | c | $ r - c $ | s | Print r |
|-------|-----|-------|-------|-----------|-------|-------------|
| 1 | 79 | 10 | | | | |
| 2 | | | 7.900 | | | |
| 3 | | | | 2.1 | | |
| 4 | | | | | 8.950 | |
| 5 | | 8.95 | | | | |
| 6 → 2 | | | 8.827 | | | |
| 3 | | | | 0.123 | | |
| 4 | | | | | 8.889 | |
| 5 | | 8.889 | | | | |
| 6 → 2 | | | 8.887 | | | |
| 3 → 7 | | | | 0.002 | | |
| 7 | | | | | | Print 8.889 |

4 a iii

| Step | A | r | c | $ r - c $ | s | Print r |
|-------|------|--------|--------|-----------|--------|--------------|
| 1 | 4275 | 50 | | | | |
| 2 | | | 85.500 | | | |
| 3 | | | | 35.5 | | |
| 4 | | | | | 67.750 | |
| 5 | | 67.75 | | | | |
| 6 → 2 | | | 63.100 | | | |
| 3 | | | | 4.65 | | |
| 4 | | | | | 65.425 | |
| 5 | | 65.425 | | | | |
| 6 → 2 | | | 65.342 | | | |
| 3 | | | | 0.083 | | |
| 4 | | | | | 65.384 | |
| 5 | | 65.384 | | | | |
| 6 → 2 | | | 65.383 | | | |
| 3 → 7 | | | | 0.001 | | |
| 7 | | | | | | Print 65.384 |

b Finds the square root of A correct to 1 decimal place.