Answers

1 Formulate approaches to solving problems (pp. 6–7)

1 Deal 1: Four plants will cost 22.50 x 2 = $45.00
   Deal 2: Four plants will cost 4 x 12.95 x 0.8 = $41.44
   Deal 2 is cheapest for four plants by $3.56.

> 0.02 x 12 because there are 12 months in a year.

2 0.02 mm per month = 0.24 mm per year.

   0.24 mm per year = 1000 mm in $\frac{1000}{0.24}$ years

   1 m = 1000 mm = 4167 years (1 dp)

   > Divide 1000 by 0.24 to find the number of years taken to grow a metre.

3 She will need $225 \times \frac{72}{30} = 540$ g of butter.

4 Multiply four and a half days by 24 (hours in a day)
   = 108 hours
   So it travelled 2160 km in 108 hours.
   To convert this to km/hour, divide both sides by 108.
   Speed = 20 km/hour.

5 The cost of hiring the digger is $90 plus $40 for each day.

2 Use mathematics and statistics (pp. 8–9)

1 a $x = 135°$ b $1750^2 - 50^2$
2 5000 steps
3 a 3.4, 3.5, 3.6, 3.7 or 3.8 m
   b 2 500 000
   c 4.6 kg
   d 45 minutes
4 a $3.80   b 30 cents

3 Explain the reasonableness of responses (pp. 10–15)

1 Agree
   Because he is left with just $2.63 until he gets paid again.
   Or:
   Can't tell for sure
   Because we don't know how often he gets paid or what other sources of income he may have.
2 Agree
   However, this will overestimate the cost because the plant and bottle are both rounded up. As a result her estimate is about $6 more than the actual price.

Or:
Disagree
She would have been better to overestimate either the plant or the bottle and underestimate the other. If she had done this she would have got an estimate of $130 which is only about $1 more than the actual cost.
3 Disagree
   Unfair because, although the height has doubled, so has the length. This means that the area of the 2022 bus is four times the area of the 2021 bus. It should have only doubled.
4 Can't tell for sure
   Because we don't know how many people play rugby in each centre.
5 Disagree
   Normal prices:
   2 parents and 1 child = 2 x $28 + 1 x $15 = $71
   2 parents and 2 children = 2 x $28 + 2 x $15 = $86
   2 parents and 1 child = 2 x $28 + 3 x $15 = $101
   So the $80 family pass only saves money for families with 2 or 3 children.
6 Agree
   Because the number of jars of honey sold has increased each week from 8 to 23.
   Or:
   Can't tell for sure
   Because, particularly if the market is outside, the number going to it will depend on the weather. If very few people go, then she will probably not sell many jars of honey.
7 Disagree
   Ben's route is 33 cm long. The shortest route is the ⊔ shape which is 30 cm long.
8 Disagree
   Because the 92 students did less than 15 minutes, homework, and that is less than half of 187 (93.5).
   Or:
   Can't tell for sure
   Because he surveyed students on just one day. It may be that not a lot of homework is set on a Monday, or that teachers ask for it at the end of the week.
9 Disagree
   Median = 16: this gives a good measure of where the centre of the data is because there are 4 values below it and 4 above.
   Mean = 14.3: this has only 3 values below it and 7 above, so the median is a better measure of the centre of the data.