

Functional Skills

Diagnostic Assessment

Mathematics

LEVEL 2

Answers

Level 2 Diagnostic Test – Number (Answers)

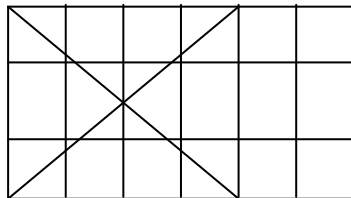
1. There are 56 cars in the college car park; $\frac{3}{4}$ of the cars are over two years old. How many cars are over two years old?

$$\frac{3}{4} \times 56 = 42$$

2. A student spends $\frac{1}{2}$ of his weekly income on food, $\frac{1}{6}$ on entertainment, $\frac{1}{4}$ on clothes and the remainder he saves. What fraction of his weekly income does he save?

$$\frac{12 - 6 - 2 - 3}{12} = \frac{1}{12}$$

This sketch shows a bar of chocolate. Shade in $\frac{2}{3}$ of the bar.



Any 12 boxes shaded

Delicious Bar

4. A school has 150 pupils; 44% are girls. How many girls are at the school?

$$150 \times \frac{40}{100} = 66$$

Level 2 Diagnostic Test – Number

5. An article is bought for £40 and sold for £48. Calculate the percentage profit.

$$48 - 40 = \text{£8 PROFIT}$$
$$\frac{8}{40} \times 100 = 20\%$$

6. Scott, Martin and Adrian are in a lottery syndicate. Each week Scott pays £2, Martin pays £3 and Adrian pays £5. They win £15,000 and divide their winnings in the same ratio as their weekly contributions. Calculate how much each receives.

$$2 : 3 : 5 = 10 \text{ PARTS}$$

$$1 \text{ Part} = \frac{\text{£1500}}{10} = \text{£150}$$

$$S \quad 1500 \times 2 = \text{£3000}$$

$$M \quad 1500 \times 3 = \text{£4500}$$

$$A \quad 1500 \times 5 = \text{£7500}$$

7. A length of wood is 2.5m long. From the wood 8 equal pieces of length 10 inches are to be cut. Given that 1 inch = 2.54 cm. Calculate to the nearest cm the amount of wood remaining.

$$250 - (8 \times 10 \times 2.54) = 46.8 \text{ cm}$$
$$= 47 \text{ cm}$$

Level 2 Diagnostic Test – Number

8. The cost of hiring a car is £30 plus 20p for every mile travelled.
a. Calculate the cost to hire the car and travel 500 miles.

$$\text{£}30 + 500 \text{ miles} \times 0.2 = \text{£}130.00$$

- b. How many miles would you have travelled if you paid a total charge of £50?

$$\text{£}50 - \text{£}30 = \text{£}20 \text{ per mileage}$$

$$\frac{20}{0.2} = 100 \text{ miles}$$

- c. Write a formulae to represent the cost of hiring a car when you have driven 'x' miles

$$\text{Total cost} = 30 + 0.2x$$

- 9 a. Simon has an overdraft of £65 on his bank account and he pays in £90. What is his balance now?

$$- 65 + 90 = \text{£}25$$

£25 in credit

- b. Angela also has an overdraft of £65 on her bank account and she pays in £50. What is her balance now?

$$- 65 + 50 = -15$$

£15 overdrawn

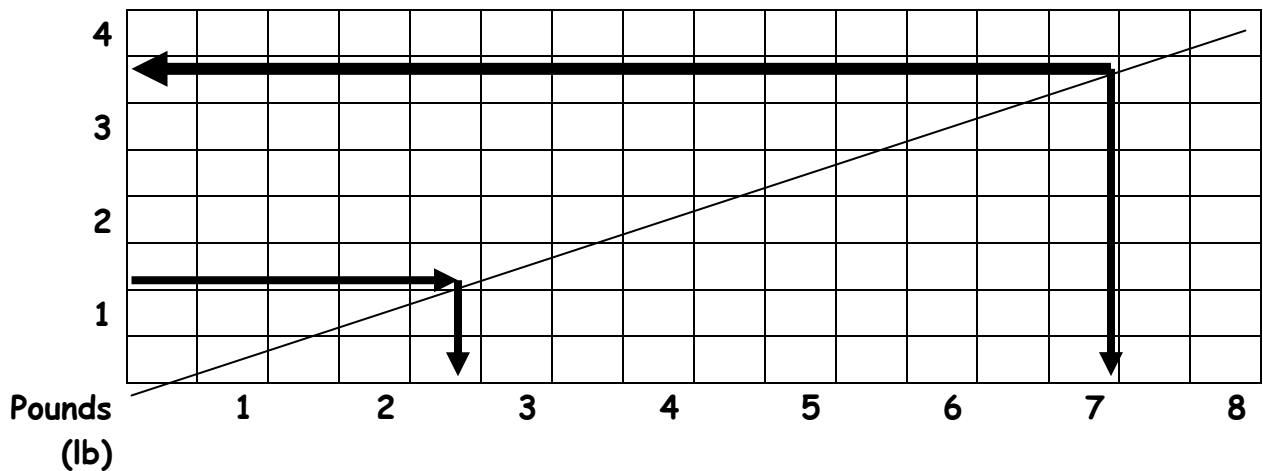
Level 2 Diagnostic Test – Number

10. The table shows the number of tins of food sold by a supermarket store during the period of 1986 – 1996. Complete the missing figures in the table.

| Year | Beans (millions) | Peaches (millions) | Soup (millions) | Total Sales |
|------|------------------|--------------------|-----------------|-------------|
| 1986 | 48.3 | 0.8 | 54.1 | 102,200,000 |
| 1988 | 69.6 | 18.2 | 52.3 | 140,100,000 |
| 1990 | 60.06 | 29.2 | 50.7 | 140,500,000 |
| 1992 | 43.7 | 50.9 | 24.7 | 119,300,000 |
| 1994 | 56.4 | 70.5 | 6.7 | 133,600,000 |
| 1996 | 56.0 | 39.8 | 4.5 | 100,300,000 |

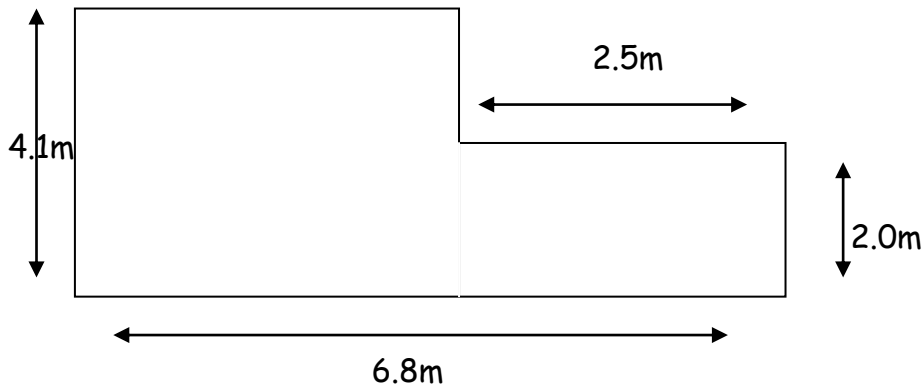
11. The graph shows the conversion of pounds to kilograms. Use the graph to estimate the weight in:

- a. Pounds of a 1 kg bag of sugar **2.1 lb**
- b. Kilograms of a 7lb maximum load for a washing machine.
3.25 kg



Level 2 Diagnostic Test – Shape & Space

12. The diagram shows the plan of a lounge. (all corners are right angles)



Calculate:

- a. The total floor area

$$4.1 \times 4.3 = 17.53 \text{ m}^2$$

$$2.5 \times 2 = 5 \text{ m}^2$$

$$\text{TOTAL} = 22.63 \text{ m}^2$$

- b. The total perimeter

$$4.1$$

$$6.8$$

$$2.0$$

$$2.5$$

$$2.1$$

$$4.3$$

$$\hline 21.8 \text{ m}$$

- c. The volume of the room, if the height is 2.4m

$$V = \text{Area} \times \text{Height}$$

$$= 22.63 \times 2.4 = 54.312 \text{ m}^3$$

Level 2 Diagnostic Test – Shape & Space

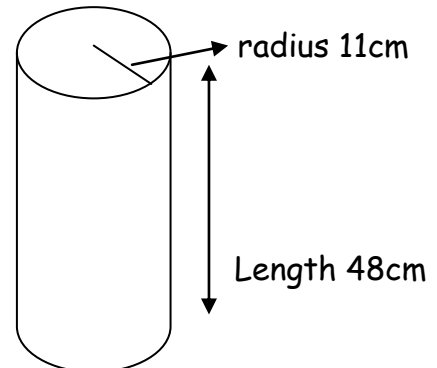
13. A water barrel is shown

a. Find the volume of water in litres it can contain when full

Use the conversion: $1000\text{cm}^3 = 1 \text{ litre}$
Express your answer in the nearest litre

$$\pi r^2 \times h = \pi \times 11^2 \times 48 = 18246.370 \text{ cm}^3$$

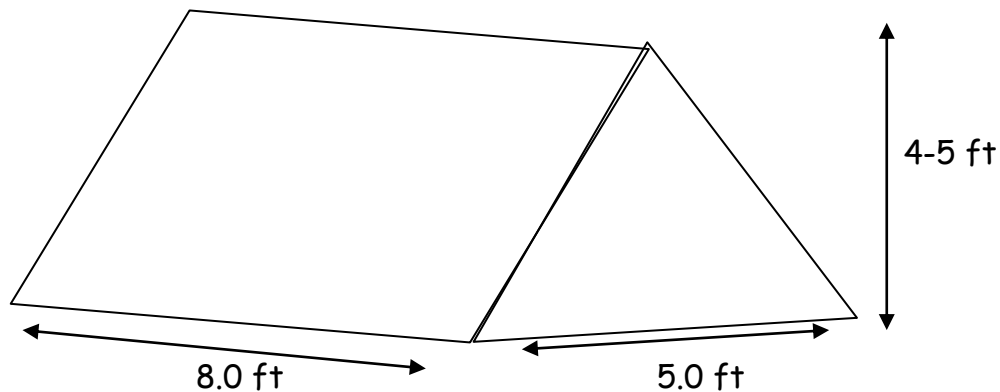
$$\frac{18246.370}{1000} = 18.246 \text{ litres} = 18 \text{ litres}$$



b. Find an estimate for the volume. Using $\pi = 3$ and working to the nearest 10cm to check your calculator answer.

$$3 \times 11^2 \times 50 = \frac{300}{1000} \times 50 = 15 \text{ litres}$$

14. Two friends go away for the weekend camping and taking a small ridge tent.



Using the sketch shown find:

a) The volume of the tent

$$\text{Using: Volume} = \text{Area} \times \text{length}$$

$$\frac{1}{2} \times 4.5 \times 8 \times 5 = 90 \text{ ft}^3$$

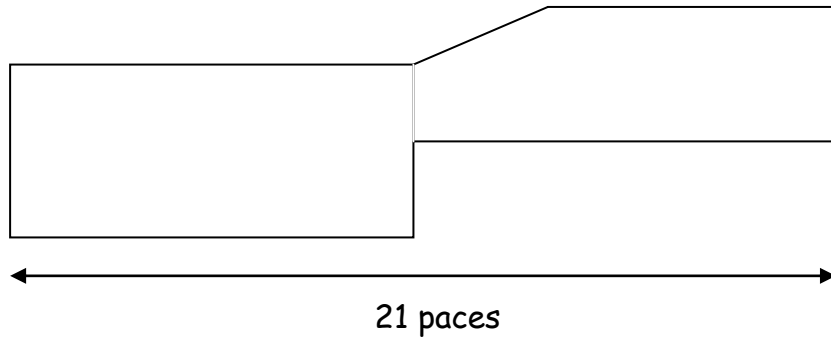
b) The floor area of the tent

$$8 \times 5 = 40 \text{ ft}^2$$

Level 2 Diagnostic Test – Shape & Space

15. Henry paces out a building in order to find its length. It is 21 paces long

Henry believes his pace is 0.9 m long



- a) What is his estimate of the length?

$$21 \times 0.9 = 18.9 \text{ m}$$

- b) In fact, Henry's paces vary between 0.85 m and 0.95 m in length

- i. What is the longest length the building could be?

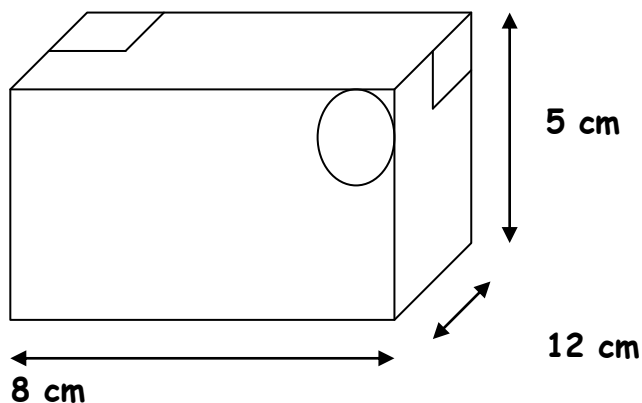
$$21 \times 0.95 = 19.95 \text{ m}$$

- ii. What is the shortest length the building could be?

$$21 \times 0.85 = 17.85 \text{ m}$$

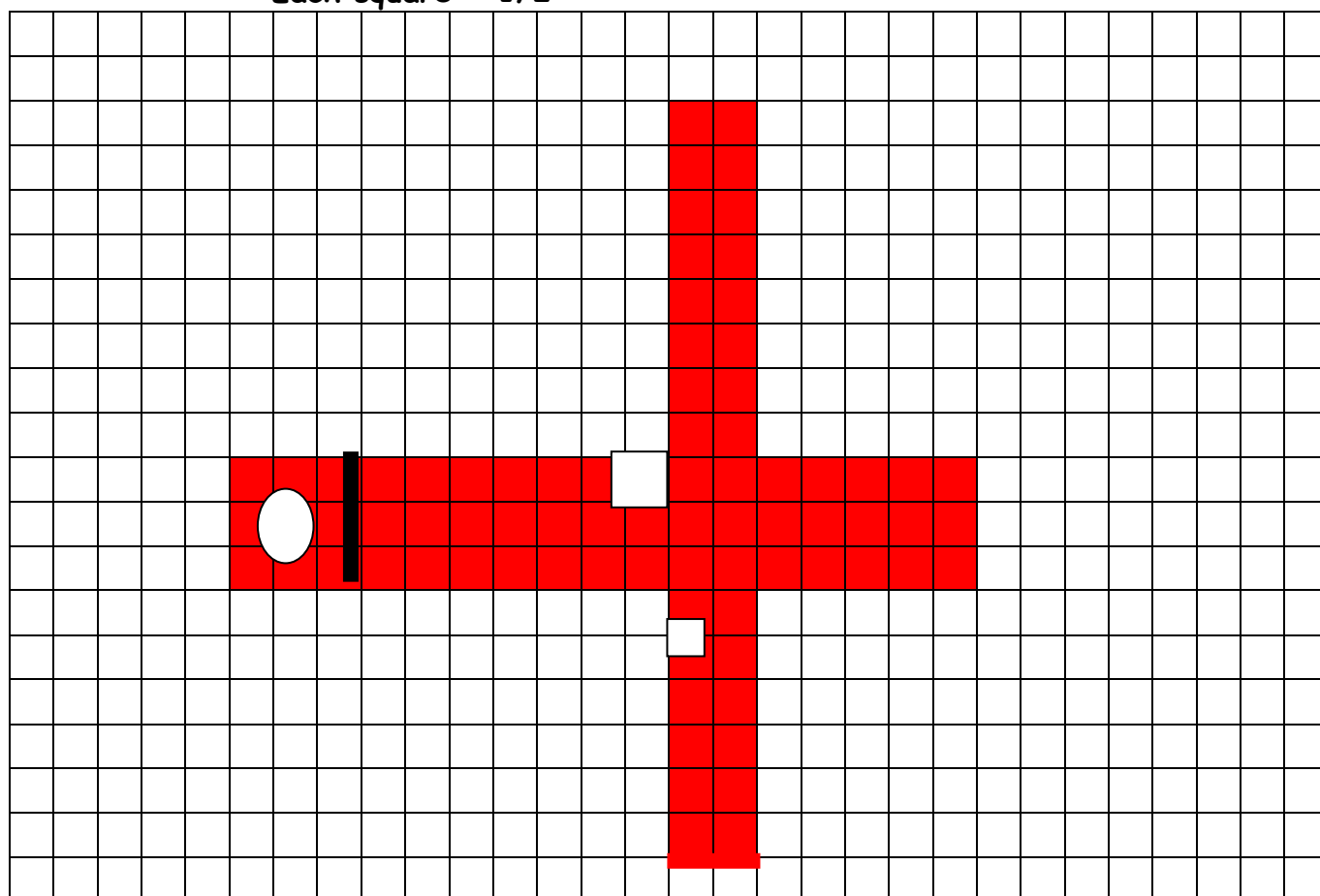
Level 2 Diagnostic Test - Shape & Space

16. The drawing shows a cuboid with 3 shapes painted on the sides (the sides not visible in the diagram are blank). The squares both have sides of 2.5 cm and the circle has a radius of 1.5cm.



Complete the net of the cuboid, showing the painted shapes. State the scale which is used for the net.

Each square = $\frac{1}{2}$

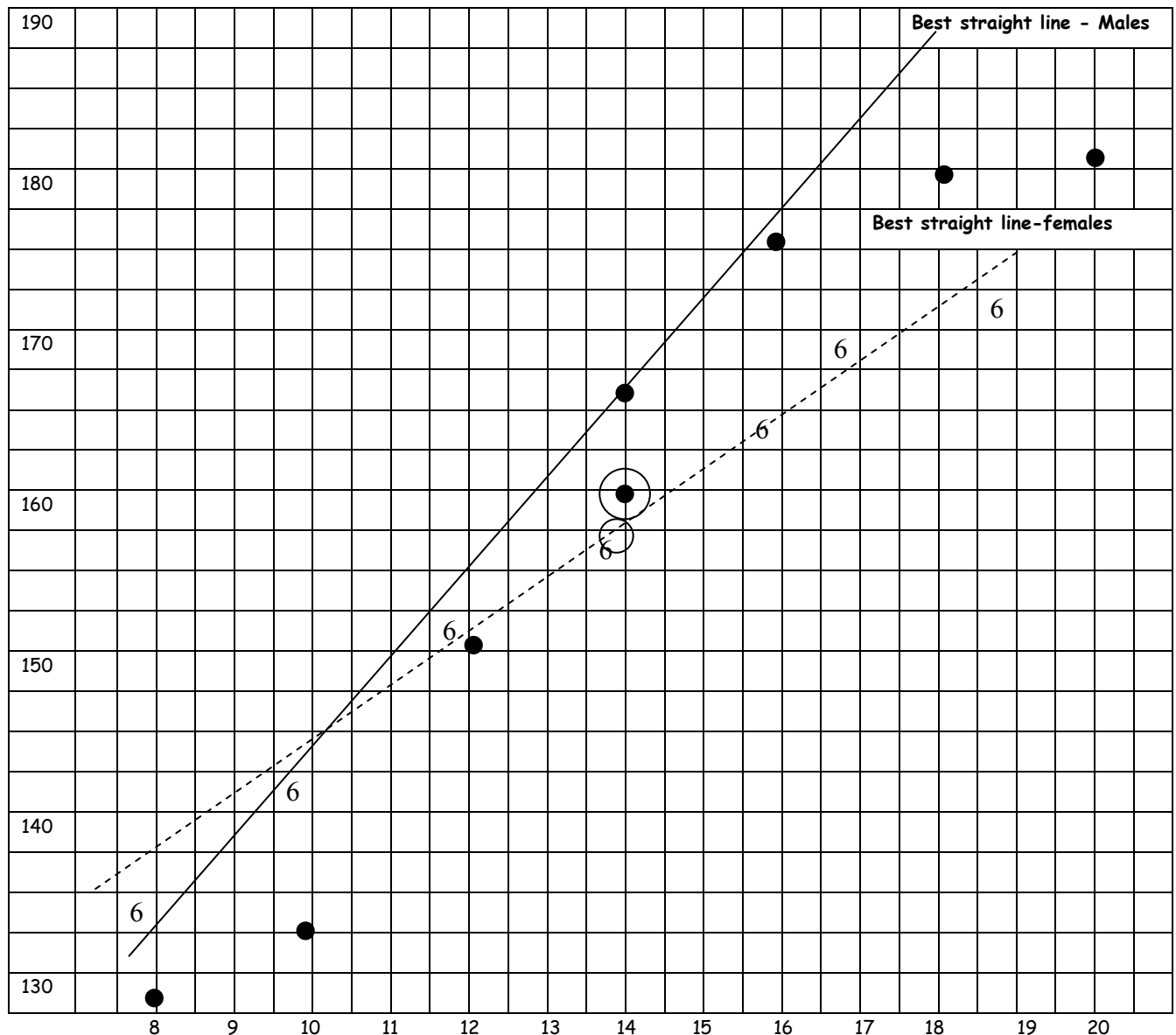


Level 2 Diagnostic Test - Handling Data

17. The table shows the mean heights of males and females between the ages of 8 and 20 years.

| | Mean | | | | | | | |
|--------------|------|-----|-----|-----|-----|-----|-----|-----|
| Ages | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 14 |
| Females (cm) | 141 | 145 | 156 | 161 | 167 | 172 | 175 | 160 |
| Males (cm) | 135 | 140 | 155 | 170 | 180 | 183 | 185 | 164 |

- a) Draw two straight lines to show the correlation between age and height.



- b) Use your graph to estimate the age when the mean height of both males and females were the same.

11 years \pm 6 months

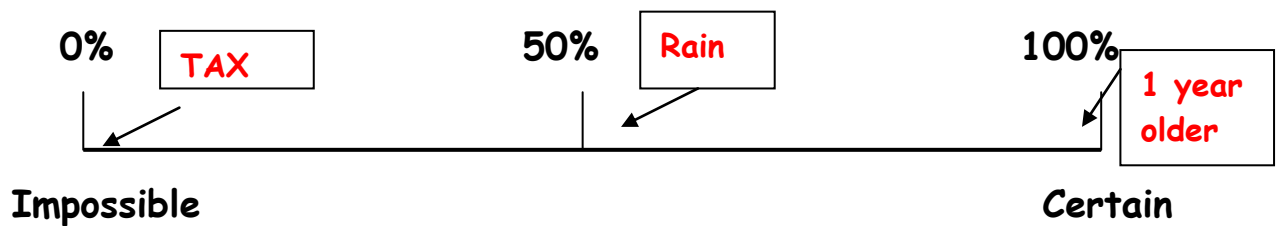
- c) At what height was this?

150 cm \pm 5 cm

Level 2 Diagnostic Test – Handling Data

18. Indicate the probability scale what you think the chance of:

- a) It raining on April 21 next year
- b) Income tax will be abolished next year
- c) Next year you will be a year older than you are today















19. What is the probability of selecting an even number from the numbers 10 to 20 inclusive?


6/11

20. The following table shows the number of umbrellas manufactured by a small factory over a 4 month period. Choose a suitable scale and draw a pictogram to represent this information.

| Month | Output |
|-------|--------|
| April | 1800 |
| May | 900 |
| June | 300 |
| July | 450 |

Other Scales Acceptable

| | |
|-------|---|
| April |       |
| May |    |
| June |  |
| July |   |

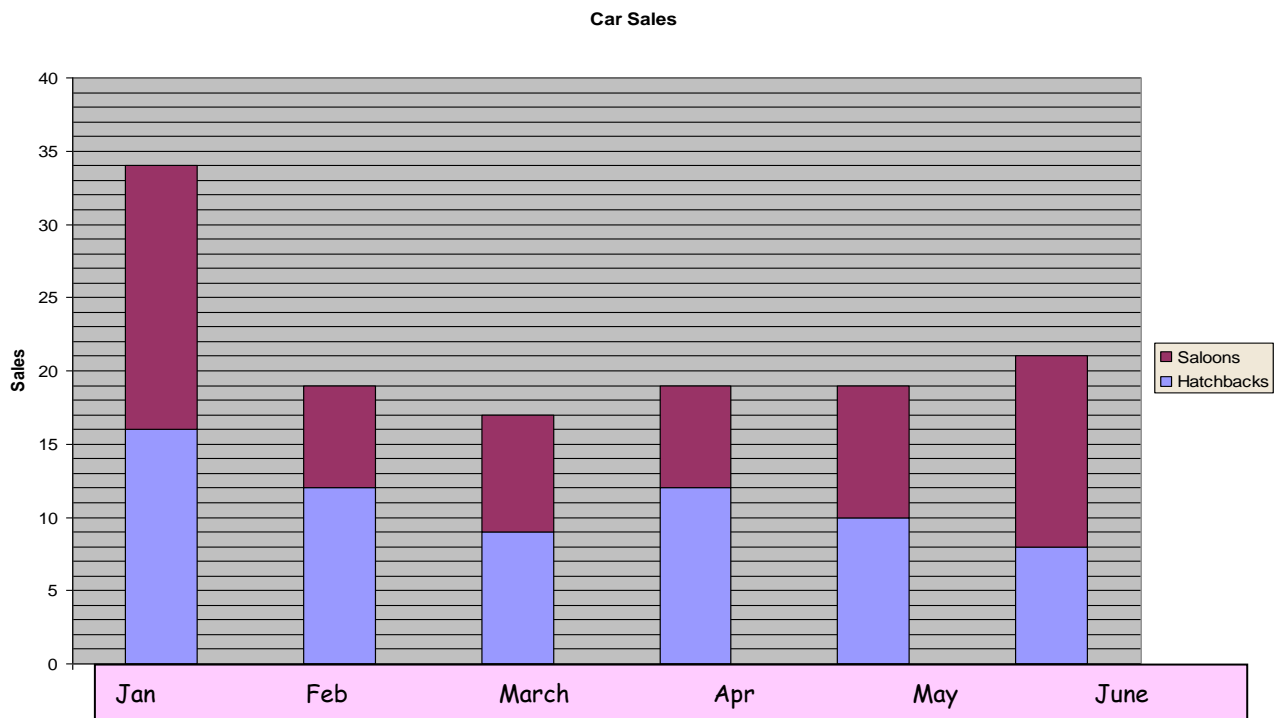
 = 300

Level 2 Diagnostic Test – Handling Data

21. The number of saloons and hatchback cars sold by a garage are shown in the Component Bar Chart

From the bar chart find the:-

- a) Number of saloon cars sold in January **18**
 b) Number of hatchback cars sold in June **8**



- c) Total number of cars sold during the 6 month period

$$34 + 19 + 17 + 19 + 19 + 21 = 129$$

22. A box contains 40 apples whose weights are shown in the frequency table below:

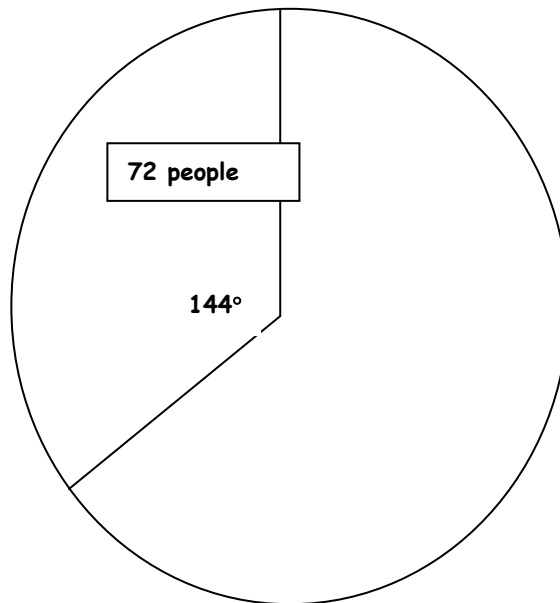
| Weight (g) | 70 | 80 | 90 | 100 | 110 | 120 | Total |
|--------------------|-----|-----|------------|-------------|------------|-----|-------------|
| Frequency | 2 | 7 | 9 | 11 | 8 | 3 | 40 |
| Weight x Frequency | 140 | 560 | 810 | 1100 | 880 | 360 | 3850 |

Using this information calculate the:

- a) Mean weight of the apples **96.25**
 b) Median weight of the apples **$40 \div 2 = 20$**
 (1/2 way between weight of 20th & 21st apples)
 c) Modal weight of the apples **100g**

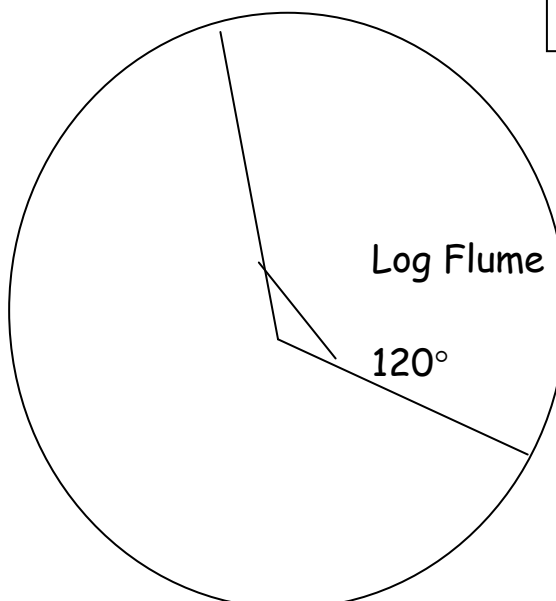
Level 2 Diagnostic Test – Handling Data

22. A sample of 180 people was taken from those visiting a theme park. They were asked which was their favourite ride.
- a) Two fifths of all people asked said their favourite ride was the roller coaster. Calculate the angle in degrees needed to represent this information and draw the angle in the pie chart.



$$\frac{2}{5} \times 360 = 144^\circ$$

- b) The angle relating to those who gave their first choice as the long flume is 120° . Calculate the number of people who preferred the log flume.



$$\frac{120 \times 180}{360} = 60 \text{ people}$$