S2 Extension – Test 1 Revision

1. Factors
1. Find the highest common factor of :-
   (a) 24 and 18   (b) 27 and 45.

2. Expressions and Formulae
1. Multiply out each of the following:-
   (a) $a(b + 2)$ (b) $b(b – 1)$ (c) $m(7 + 4m)$

2. Expand and simplify the following:-
   (a) $p(4 + p) – 3p$ (b) $x(2y + 1) + x(y – 2)$ (d) $m(3m + n) – n(2m + n)$

3. Factorise each of the following expressions :-
   (a) $3n + 6$ (b) $12 – 8d$ (c) $ab + 5a$ (d) $2pq – 10pr$
   (e) $x^2 + 4x$ (f) $3y – 5y^2$

4. Distance, Speed and Time

1. Jane runs 18 kilometres in 1 hour 12 minutes.
   Calculate her average speed.

2. Calculate the distance travelled in 2 hours 42 minutes at an average
   speed of 50 miles per hour.

3. How long (in hours and minutes) does it take for a journey of 152 kilometres
   at an average speed of 80 kilometres per hour ?

4. The graph shows the journeys of two buses.   One going from Edinburgh
   to Inverness and the other bus going from Inverness to Edinburgh.
   Both buses stop in Perth.
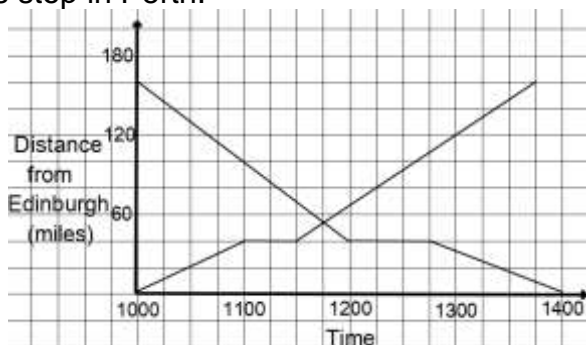
   (a) At what time did the buses pass each other?
   (b) How long does the bus from Edinburgh stop at Perth?
   (c) How far is Inverness from Perth?

5. The graph shows Jim's journey from Haddington to Dundee and back.
   On the return journey Jim stopped in Perth.
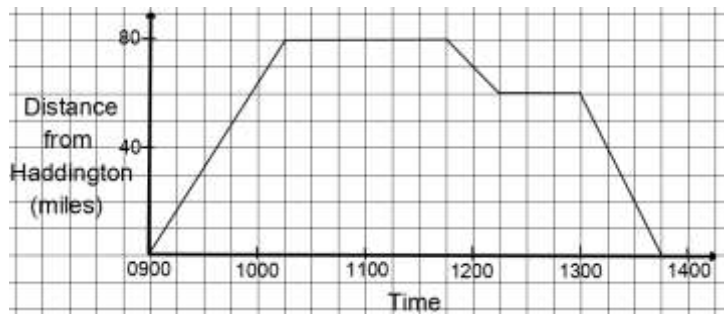
   (a) What time did Jim arive in Dundee?
   (b) For how long did Jim stop in Perth?
   (c) How far is Perth from Haddington?
   (d) On which part of the return journey was Jim's average speed
       faster – Dundee to Perth or Perth to Haddington?
       Explain how you can tell this from the graph.

5. Area

1. Calculate the total area of this shape which consists of a semi-circle and a
   rectangle.
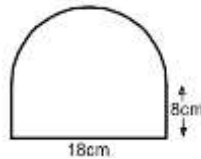
2. Calculate the total area of this shape which consists of a rectangle and two semi-
   circles.
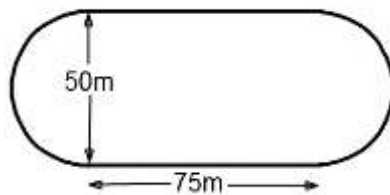
6. Information Handling
1. The number of cheese sandwiches sold by a sandwich bar was recorded
    for 18 days.

28	38	19	33	29	32	37	41	27
50	45	23	44	38	34	36	52	26

Display this information in a stem and leaf diagram.

2. A factory has a small workforce of eleven people. The owner decides to compare absence rates (in days) over the last two years.
The results are shown in the back-to-back stem-and-leaf diagram below.

Absences (days)

last year   *this year*

7 6	0	3 9 9
5	1	1 1 7
8 5 1	2	4 6
7 2 0	3	3
4 2	4	1 5
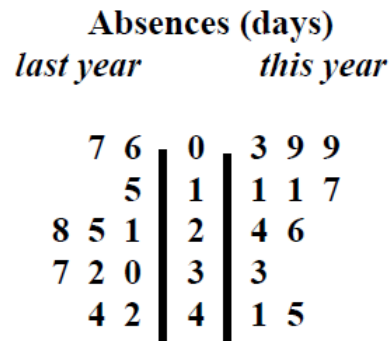
(a) What is the largest number of absences recorded?
(b) What is the smallest number of absences recorded last year?
(c) Compare the number of absences for "last year" and "this year".

ANSWERS

1. Factors
1. (a) 6   (b) 9

2. Expressions and Formulae
1. (a) ab + 2a   (b) $b^2 - b$ (c) $7m + 4m^2$

2. (a) $p^2 + p$ (b) 3xy + x   (d) $3m^2 - mn - n^2$

3. (a) 3(n + 2)   (b) 4(3 − 2d)   (c) a(b + 5)   (d) 2p(q − 5r)   (e) x(x + 4)   (f) y(3 − 5y)

3. Distance, Speed and Time
1. 15 km/h   2. 135 miles   3. 1 hour 54 minutes
4. (a) 1145   (b) 30 minutes   (c) 120 miles
5. (a) 1015   (b) 45 minutes   (c) 60 miles
   (d) Perth to Haddington because this part of the graph is steeper.

4. Area
1. $395 \cdot 2 cm^2$ 2. $5712 \cdot 5 m^2$

5. Information Handling
1. Ask your teacher to check your answer.
2. (a) 45   (b) 6   (c) There were fewer absences this year; 229 compared to 287.

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