GCSE (9-1) Mathematics

J560/02 Paper 2 (Foundation Tier)

Question Set 6

1. **(a)** **(i)** Write 350 centimetres in metres.

1000 cm = 1 meter

(a)(i) 0.350 m **[1]**

(ii) Write 1.52 litres in millilitres.

1000 ml = 1 Litre

(ii) 1520 ml **[1]**

(b) Work out.

5.7 cm + 30 mm.

Give your answer in centimetres.

10 mm = 1 cm

30 mm = 3 cm

5.7 + 3 = 8.7 cm

(b) 8.7 cm **[2]**

2. **(a)** Complete each statement by writing the missing value in the box.

(i) $\frac{1}{3} = \frac{2}{\boxed{6}}$ **[1]**

(ii) $1\frac{1}{7} = \frac{\boxed{8}}{7}$ $\frac{(1\times7)+1}{7} = \frac{8}{7}$ **[1]**

(b) Work out.

(i) 0.8 ÷ 2

8 ÷ 2 = 4

0.8 ÷ 2 = 0.4

(b)(i) 0.4 **[1]**

(ii) 1.7 × 2

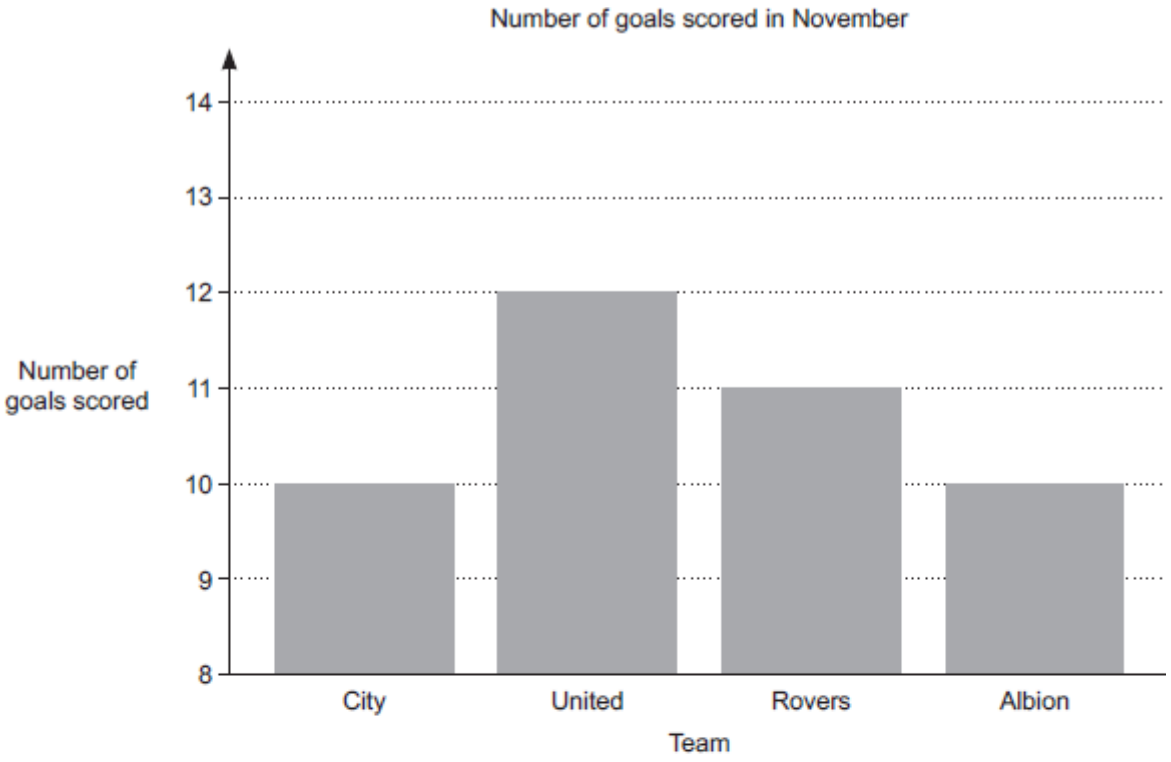
1 × 2 = 2

0.7 × 2 = 1.4

+ = 3.4

(ii) 3.4 **[1]**

3. This is Nadia's bar chart to show the number of goals scored by four teams during November.



(a) Blake says

Nadia's bar chart shows that United scored twice as many goals as City.

Is Blake correct?
Give a reason for your answer.

NO because City = 10 United = 12
10 x 2 = 20 and not 12. **[1]**

(b) Give one way in which Nadia can improve her bar chart.

start bar chart from zero.

[1]

(c) Kareem says

Out of these four teams, United achieved the highest mean number of goals per game during November.

What assumption has Kareem made?

All four teams played the same amount of games. **[1]**

4. (a) Write $3 \times 3 \times 3 \times 3$ as a power of 3.

4

(a) 3^4 [1]

(b) Show that the answer to $2^6 \times 4^{-1}$ is a square number.

$2^6 = 64$

$4^{-1} = 1/4$

$\frac{64}{1} \times \frac{1}{4} = \frac{64}{4} = 16$

$\sqrt{16} = 4$

4

[3]

5. Simplify.

(a) $\frac{5b^6}{b^2}$

(a) $5b^4$ [1]

(b) $(x^4)^3$

(b) x^{12} [1]

6. Theo invests £500 at a rate of 6% per year simple interest.

(a) Work out the interest he receives in one year.

$500 \times 1.06 = 530$

$530 - 500 = £30$

(a) £ 30 [2]

(b) Work out the value of his investment after 5 years.

$30 \times 5 = 150$

$500 + 150 = 650$

(b) £ 650 [2]

7. A bag only contains red, blue, yellow and white counters.
A counter is taken at random from the bag.
The table shows the probability it is red and the probability it is blue.

Colour	red	blue	yellow	white
Probability	0.24	0.34	0.28	0.14

There are twice as many yellow counters as white counters in the bag.

Complete the table. **[5]**

yellow $= 2x$ white $= x$

$0.24 + 0.34 + x + 2x = 1$

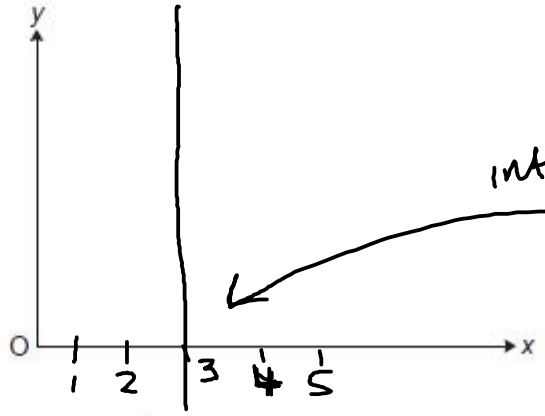
$0.58 + 3x = 1 \longrightarrow 3x = 0.42$

$x = 0.14$

yellow $= 2 \times 0.14 = 0.28$

white $= 0.14$

8. **(a)** **(i)** Sketch the graph of $x = 3$.
Show clearly the value of any intercepts.

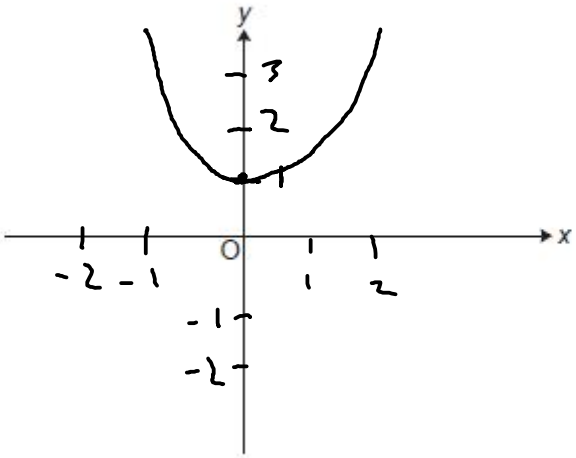


intercept (3,0)

[2]

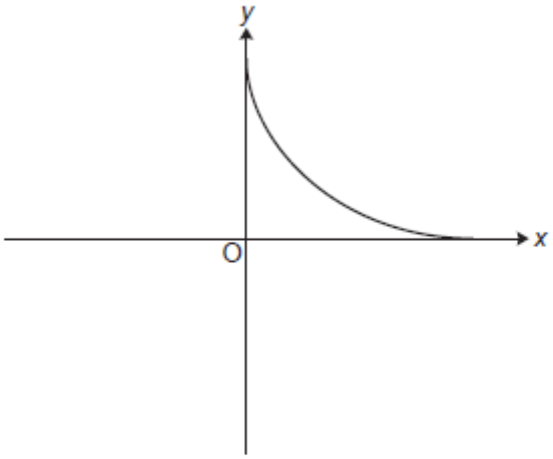
(ii) Sketch the graph of $y = x^2 + 1$.
Show clearly the value of any intercepts.

y intercept when $x = 0$ → (0, 1)



[2]

(b) Toby has sketched the graph of $y = \frac{1}{x}$ below.



Make two comments about the accuracy of his sketch.

1 Graph shouldn't be touching axes

2 Missing the part of graph in bottom left square

[2]

9. A clock chimes every 20 minutes.
A light flashes every 8 minutes.
The clock chimes and the light flashes together at 08:00.

How many times between 08:01 and 12:30 will the clock chime and the light flash together?
Show your working.

LCM = 40

$20 \times 2 = 40$
$8 \times 5 = 40$

So every 40 minutes they flash and chime together.

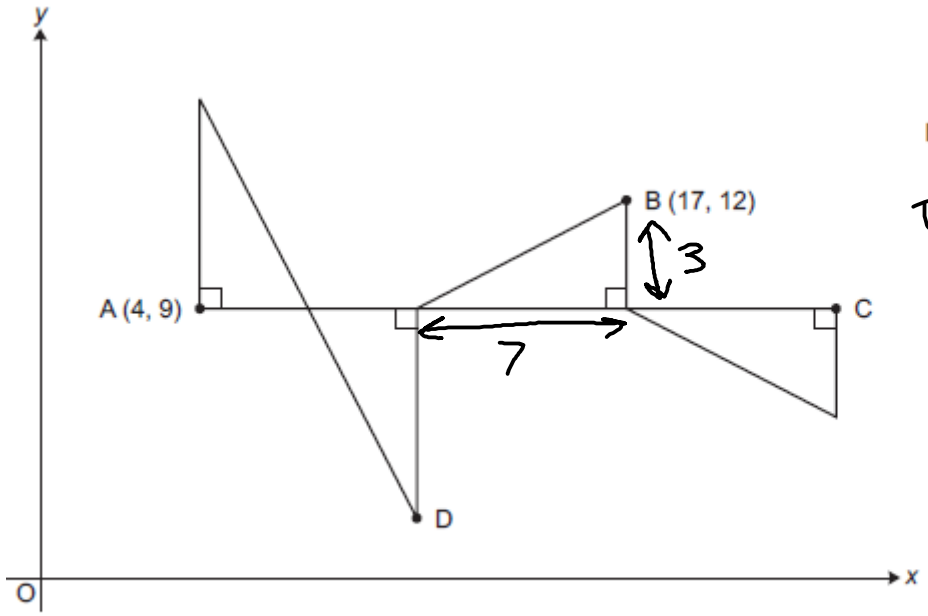
8:40
9:20
10:00
10:40

11:20
12:00

So 6 times

6 **[5]**

10. A pattern is made from four congruent right-angled triangles.



Not to scale

Triangles congruent so all are similar to each other.

The line AC is parallel to the *x*-axis.
The point A has coordinates (4, 9) and the point B has coordinates (17, 12).

Work out the coordinates of point C and point D.

If AC is parallel to x-axis, it means point A and C share the same y-cordinate as same height.

If compare point A to B you can tell by using y coordinates $12-9=3$. The smallest length of the triangles are 3.

Distance from A to B using x cordinates is $17-4=13$.

so that is $3+3+x=13$ $x=7$ = long side attached to right angle.

So C x-cordinate is $7+17=24$. y-cordinate $=9$.

D x-cordinate is $4+3+3=10$

y-cordinate is $9-7=2$

C (24 , 9)

D (10 , 2) **[5]**

11. Solve the simultaneous equations.

$2x + 3y = 10$
$3x + 5y = 17$

① $2x + 3y = 10$

② $3x + 5y = 17$

① × 3 → $6x + 9y = 30$

② × 2 → $6x + 10y = 34$

$-y = -4$

$y = 4$

Sub $y = 4$ in ①

$2x + 3(4) = 10$

$2x + 12 = 10$

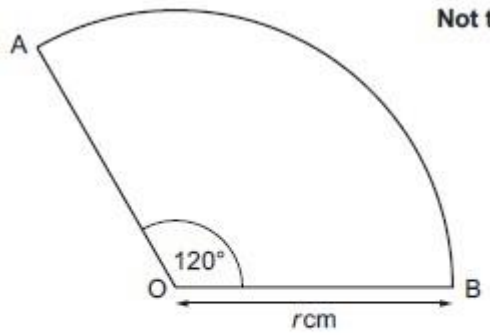
$2x = -2$

$x = -1$

$x =$ −1

$y =$ 4 **[4]**

12. AOB is a sector of a circle, centre O.



The area of the sector is 8 cm^2.

Work out the exact value of the radius, r cm.

area of sector $\rightarrow \frac{\theta}{360} \times \pi \times r^2$

$\frac{120}{360} \times \pi \times r^2 = 8 \rightarrow 1/3 \times \pi \times r^2 = 8$

$\pi \times r^2 = 24 \rightarrow \frac{24}{\pi} = r^2 \rightarrow r = \sqrt{\frac{24}{\pi}}$

$r =$ $\sqrt{\frac{24}{\pi}}$ cm **[4]**

Total Marks for Question Set 6: 50