GCSE (9-1) Mathematics

J560/02 Paper 2 (Foundation Tier)

Question Set 1

1. (a) (i) Work out.

(a) 0.7×0.3

$$0.7 \times 0.3$$

(a) ....0.21.......... **[1]**

(b) **(b)** $0.48 \div 6$

$$0.48 \div 6 = 0.08$$

(b) ....0.08.......... **[1]**

2. (a) (i) Complete each statement.

(i) $\dfrac{3}{7} = \dfrac{12}{28}$ $\times 4$

$\times 4$ **[1]**

(ii) $4\dfrac{1}{2} = \dfrac{9}{2}$ $\dfrac{(4 \times 2) + 1}{2} = \dfrac{9}{2}$ **[1]**

(b) Work out.

$\times 5$

$\dfrac{2}{3} = \dfrac{10}{15}$

$\times 5$

$$\dfrac{\overset{2}{3} - \overset{1}{5}}{}$$

$\times 3$ $\dfrac{1}{5} = \dfrac{3}{15}$ $\times 3$

$LCM \rightarrow 15$

$$\dfrac{10}{15} - \dfrac{3}{15} = \dfrac{7}{15}$$

$\dfrac{7}{15}$

(b) ..$\dfrac{7}{15}$.......... **[2]**

3. (a) (i) Complete the following.

(i) $5^2 =$ ......25...... **[1]**

(ii) (ii) $\sqrt[3]{64} =$ ......4...... **[1]**

(b)   Work out $2^3 \times \sqrt{49}$.

$2^3 \rightarrow 2 \times 2 \times 2 = \underline{8}$ $8 \times 7 = \underline{\underline{56}}$
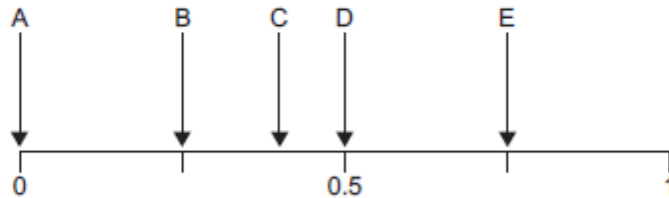
$\sqrt{49} \rightarrow \underline{7}$

(b)   ....56.................................. **[2]**

4.   **(a)   (i)**   Darren has these 20 crayons in a box:

- 8 blue
- 4 red
- 5 black
- 3 green.

(a)   He chooses a crayon at random from the box.

Which arrow shows the probability that this crayon is

(i)   blue, $8/20 = \underline{\underline{0.4}}$

(a)(i)   Arrow ....C................. **[1]**

(ii)   yellow,

O chance

(ii)   Arrow ....A................. **[1]**

(iii)   **(iii)   not** black.

$black = \frac{5}{20}$

$1 - 5/20 = \underline{\underline{3/4}} = \underline{\underline{0.75}} = \underline{\underline{E}}$

(iii)   Arrow ....E................. **[1]**

(b) Darren buys 16 more crayons that are either blue or red.
He puts these in the box with the 20 crayons he already has.

He now picks a crayon at random from the box.
The probability that he picks a **blue** crayon is evens.

How many **red** crayons did he buy? $20 + 16 = 36$

evens means 50% ✗

Now, its 36 crayons and 50% = 18 blue

originally 8 blue now 18 blue so out of 16 raw crayons
10 are blue

$16 - 10 = 6$ red bought

(b) ....6.................. **[3]**

5 (a) (i) **(a)** Simplify fully.

(i) $3t + 5u - 2t + 3u$

$3t - 2t = t \longrightarrow 8u + t$
$5u + 3v = 8v$

(a)(i) ....$8v + t$.................. **[2]**

(ii) $6a \times 2a^2$

$6 \times 2 = 12$ $12 \times a^3 = 12a^3$

$a \times a^2 = a^3$

(ii) ....$12a^3$.................. **[2]**

(b) Make x the subject of the formula $y = x^2 - 1$.

$y = x^2 - 1 \implies y + 1 = x^2 \implies \sqrt{y+1} = x$

(b) ....$x = \pm\sqrt{y+1}$.................. **[2]**

6   (a)   Rashid is making cupcakes using these ingredients.

┌─────────────────────────────────┐
│   **Cupcake ingredients**   │
│   │
│   *Makes 20 cupcakes*   │
│   │
│ 120g flour   │
│   │
│ 140g butter   │
│   │
│ 4 eggs   │
│   │
│ 60g cocoa powder   │
│   │
│ 50ml of water   │
└─────────────────────────────────┘

(a) How many eggs does he need to make 60 cupcakes?

$\frac{60}{20} = 3$ → So need 3 times of each ingredient.

3 × 4 eggs = 12

(a) ....12................ [1]

(b)   How much butter is needed to make 5 cupcakes?

$\frac{20}{5} = 4$ → so needs 4 times less each ingredient.

$\frac{140}{4} = 35$ grams

(b) ....35................ g [2]

[2]

(c)   Rashid has 210g of cocoa powder and plenty of the other ingredients.
       He says that he can make at least 75 cupcakes.

       Is he correct?
       Explain your reasoning.

20 cupcakes need 60 grams → $\frac{60}{20} = 3$ grams per cupcake

3 × 75 cupcakes = 225 grams needed

225 − 210 = 15 grams short

Not correct because he needs 15g .... [3]
                                   more.

7   (a)   Triangle **A** is drawn on the grid below.
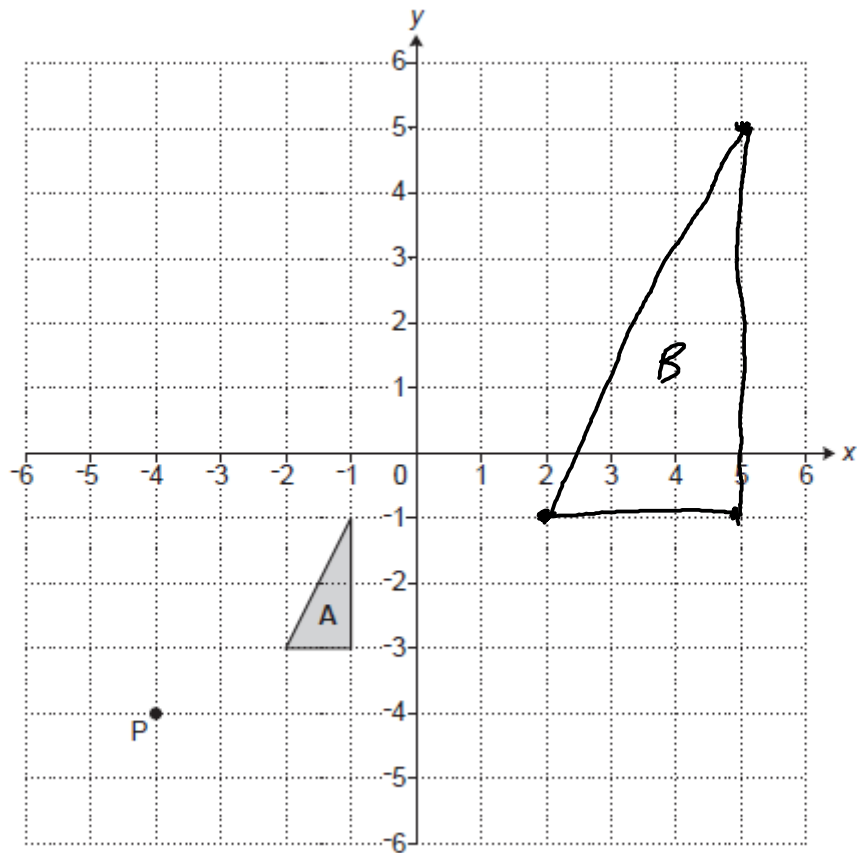
(a) Enlarge triangle **A** with scale factor 3 from the centre of enlargement P.
      Label the image **B**.   [3]

(b)   Describe fully the **single** transformation that maps triangle **B** onto triangle **A**.

Enlarge triangle B scale factor ⅓
from centre of enlargment P.   [3]

8   (a)   A sunflower grows at a rate of 4 cm each day.

           How many days does it take to grow from a height of 80 cm to more than 1.06 m?

1.06m = 106 cm   106 − 80 = 26 cm

$\dfrac{26}{4}$ = 6.5 days to 26

So 7 days for more than 26

(a)   7   [3]

(b) If the sunflower grows at a faster rate, how would this affect your answer to part **(a)**?

would take less days so my answer [1] would be smaller than 7

9.

Adam buys some theatre tickets in a sale.

The normal prices are:

> £80 for each adult
> £40 for each child.

In the sale, the prices are reduced by 15%.
Adam buys 2 adult tickets and 1 child ticket at the sale price.
A 2% booking fee is then added to the total cost of the tickets.

Calculate the total amount that Adam must pay.

Ticket Sale
All prices reduced
by 15%

(2% booking fee
applies)
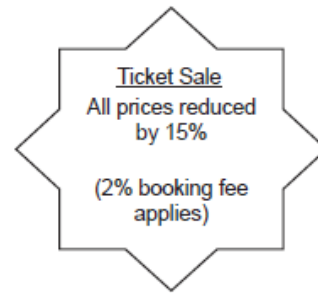
2 adult tickets → (2 × 80 × 0.85) = £136

1 child ticket → (1 × 40 × 0.85) = £34

£34 + £136 = £170 total after sale

add 2% to total → 170 × 1.02 = £173.4

£ ......173.40...... [6]

10.

The diagram shows two intersecting straight lines.

$35 + 20 = 55^{\circ}$

$(x+20)^{\circ}$ y° $(3x-50)^{\circ}$

y°

Not to scale

$3(35) - 50 = 105 - 50 = 55^{\circ}$
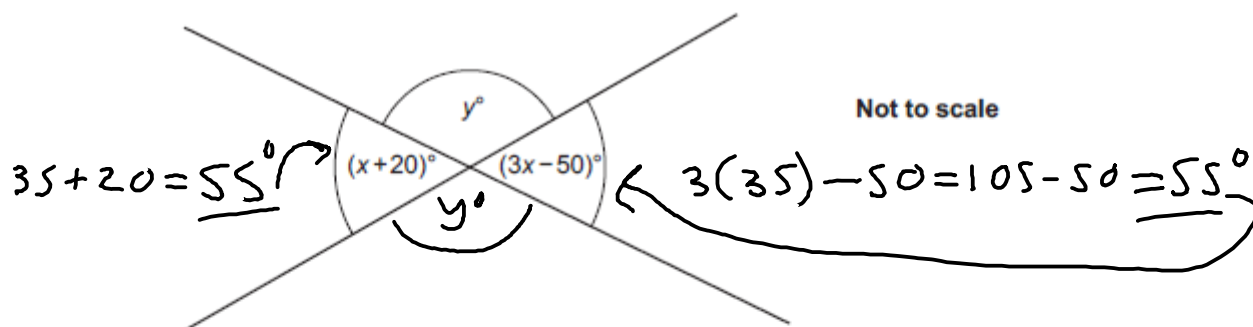
Find the value of *y*.

In this case opposite angles are equal.

$x + 20 = 3x - 50 \longrightarrow 70 = 2x \longrightarrow \underline{x = 35^{\circ}}$

Both angles on either side of y are 55° as shown by me in diagram.

$35 + 20 = 55^{\circ}$ $3(35) - 50 = 55^{\circ}$

$360^{\circ} - (55 + 55) = 2y$

$250^{\circ} = 2y$

$y = 125^{\circ}$

$y = \underline{125^{\circ}}$ .... **[6]**

Total Marks for Question Set 1: 50