

# Key Stage Two

# Mathematics

# SATS Practice Papers

## Pupil-friendly Answers

- Perfect for Key Stage Two pupils
- Can be used to mark their own work
- Or swap with a partner and mark each other's

# Set A Paper 1: Arithmetic

Ask your teacher if you're not sure how many marks to give.

1. 32

2. 1612

3. 295

4. 359

5. 32

6. 315

$$\begin{array}{r} 2\ 6\ 5\ 8 \\ +\ 7\ 1\ 8 \\ \hline 3\ 3\ 7\ 6 \\ \small{1\ 1} \end{array}$$

8.  $7 \times 3 \times 4 = 7 \times 12 = 84$

9. 28.7

$$\begin{array}{r} 4\cancel{5}\ 14\ 0 \\ -\ 3\ 7\ 0 \\ \hline 1\ 7\ 0 \end{array}$$

11. Method 1:

$$\begin{array}{r} 4\ 2\ 7 \\ \times\ 6 \\ \hline 2\ 5\ 6\ 2 \\ \small{1\ 4} \end{array}$$

Method 2:

×	6
400	2400
20	120
7	42
	<b>2562</b>

12.  $4 \times 7 = 28$

So  $40 \times 70 = 28 \times 100 = 2800$

13. 0.482

$$7 \overline{) 44^28}$$

15.  $\frac{17}{19} - \frac{12}{19} = \frac{17-12}{19} = \frac{5}{19}$

16. 9.347

17.  $42 \div 6 = 7$

So  $42\ 000 \div 6 = 7 \times 1000 = 7000$

$$\begin{array}{r} 3\ 3.\ 4\ 5\ 0 \\ +\ 6.\ 7\ 4\ 3 \\ \hline 4\ 0.\ 1\ 9\ 3 \\ \small{1\ 1} \end{array}$$

19.  $177\ 423 - 63\ 999 = 177\ 423 - 64\ 000 + 1$

Do the subtraction first, then add the 1:

$$\begin{array}{r} 1\ 7\ 7\ 4\ 2\ 3 \\ -\ 6\ 4\ 0\ 0\ 0 \\ \hline 1\ 1\ 3\ 4\ 2\ 3 \end{array}$$

So  $177\ 423 - 63\ 999 = 113\ 423 + 1 = 113\ 424$

$$\begin{array}{r} 5\ 8.\ 9\ 10 \\ -\ 4.\ 5\ 5 \\ \hline 1.\ 4\ 5 \end{array}$$

21.  $11^2 + 9 = 121 + 9 = 130$

22.  $10\% \times 250 = 250 \div 10 = 25$

$40\% \times 250 = 4 \times 25 = 100$

23.  $7 \times 9 = 63$

So  $0.7 \times 9 = 63 \div 10 = 6.3$

24.  $\frac{3}{4} \times 120 = \frac{3 \times 120}{4} = \frac{360}{4} = 90$

25. Method 1:

$$\begin{array}{r} 4\ 9\ 3 \\ \times\ 2\ 4 \\ \hline 1\ 9\ 7\ 2 \\ \small{3\ 1} \\ 9\ 8\ 6\ 0 \\ \small{1} \\ \hline 1\ 1\ 8\ 3\ 2 \\ \small{1\ 1} \end{array}$$

Method 2:

×	20	4
400	8000	1600
90	1800	360
3	60	12
	9860	1972
	<b>11 832</b>	

Give 2 marks if the answer is 11 832.

Give 1 mark if the answer is wrong but they've tried to use a correct method.

26.  $\frac{3}{8} + \frac{5}{16} = \frac{6}{16} + \frac{5}{16} = \frac{11}{16}$

27. Method 1:

$$\begin{array}{r} 3\ 2\ 4 \\ 16 \overline{) 5\ 1\ 8\ 4} \\ -\ 4\ 8 \\ \hline 3\ 8 \\ -\ 3\ 2 \\ \hline 6\ 4 \\ -\ 6\ 4 \\ \hline 0 \end{array}$$

Method 2:

$$16 \overline{) 5^5 1^3 8^6 4}$$

Give 2 marks if the answer is 324.

Give 1 mark if the answer is wrong but they've tried to use a correct method.

28. 10% of 120 =  $120 \div 10 = 12$   
 30% of 120 =  $3 \times 12 = 36$   
 5% of 120 =  $12 \div 2 = 6$   
 35% of 120 =  $36 + 6 = 42$

29.  $(38 + 12) \div 5 - 3 = 50 \div 5 - 3$   
 $= 10 - 3 = 7$

30.  $1\frac{2}{7} + \frac{5}{14} = \frac{9}{7} + \frac{5}{14}$   
 $= \frac{18}{14} + \frac{5}{14}$   
 $= \frac{18+5}{14} = \frac{23}{14}$  or  $1\frac{9}{14}$

31.  $\frac{3}{23} \times 4 = \frac{3 \times 4}{23} = \frac{12}{23}$

32. Method 1:

$$\begin{array}{r} 2641 \\ \times \quad 35 \\ \hline 13205 \\ 79230 \\ \hline 92435 \end{array}$$

Method 2:

$\times$	30	5
2000	60 000	10 000
600	18 000	3000
40	1200	200
1	30	5
	79 230	13 205
	<b>92 435</b>	

Give **2 marks** if the answer is **92 435**.  
 Give **1 mark** if the answer is wrong but they've tried to use a correct method.

33.  $\frac{5}{12} - \frac{2}{9} = \frac{15}{36} - \frac{8}{36}$   
 $= \frac{15-8}{36} = \frac{7}{36}$

34.  $\frac{3}{7} \times \frac{4}{5} = \frac{3 \times 4}{7 \times 5} = \frac{12}{35}$

35.  $\frac{7}{36} \div 2 = \frac{7}{36 \times 2} = \frac{7}{72}$

36. Method 1:

$$\begin{array}{r} 57 \\ 27 \overline{) 1539} \\ \underline{-135} \\ 189 \\ \underline{-189} \\ 0 \end{array}$$

Method 2:

$$27 \overline{) 1539}$$

Give **2 marks** if the answer is **57**.  
 Give **1 mark** if the answer is wrong but they've tried to use a correct method.

## Set A Paper 2: Reasoning

Ask your teacher if you're not sure how many marks to give.

1a.  $3 \times 8 = 24$  or  $4 \times 8 = 32$

1b.  $3 \times 4 = 12$  or  $4 \times 3 = 12$

2a.  $7^\circ\text{C}$  to  $0^\circ\text{C}$  is  $7^\circ\text{C}$ .  
 $0^\circ\text{C}$  to  $-2^\circ\text{C}$  is  $2^\circ\text{C}$ .  
 So, total change is  
 $7^\circ\text{C} + 2^\circ\text{C} = 9^\circ\text{C}$

2b.  $-2^\circ\text{C} - 3^\circ\text{C} = -5^\circ\text{C}$

3a.

$$\begin{array}{r} 264000 \\ + 288500 \\ \hline 552500 \\ \hline \end{array}$$

3b.

$$\begin{array}{r} 288500 \\ - 54450 \\ \hline 234050 \end{array}$$

4a. **Circumference**

4b.  $12 \times 2 = 24 \text{ cm}$

5a. **1**5b. **2**6. **0.165, 0.62, 5.6, 6.052, 6.4**7. **1, 3, 5, 15**

8.  $8 = 2 \times 4$ , so 8 eggs is 4 times as many as in the recipe.  
4 times as many cubes of butter  
 $= 5 \times 4 = 20$  cubes

9. 2 sketch pads cost  
 $\pounds 12.30 \div 3 = \pounds 4.10$   
So the book costs:

$$\begin{array}{r} \pounds \overset{0}{\cancel{1}} \overset{0}{\cancel{0}} \overset{0}{\cancel{1}} \overset{0}{\cancel{0}} \\ - \pounds \quad 4 \quad . \quad 1 \quad 0 \\ \hline \pounds \quad 5 \quad . \quad 9 \quad 0 \end{array}$$

Give **2 marks** if the answer is **£5.90**.  
Give **1 mark** if the answer is wrong but they've used a sensible method.

10. Give **1 mark** if the angle they've drawn between the base and the slanted side on the right is between  $73^\circ$  and  $77^\circ$ .  
Give **1 mark** if the slanted side on the right is between **5.3 cm** and **5.7 cm** long.

11. A rectangle that's:  
**6 units high and 2 units long**  
or **2 units high and 6 units long**  
or **1 unit high and 12 units long**  
or **12 units high and 1 unit long**

12.  $\pounds 5.50 - \pounds 3 = \pounds 2.50$   
 $\pounds 2.50 \div \pounds 0.50 = 5$

Give **2 marks** if the answer is **5**.  
Give **1 mark** if the answer is wrong but they've used a sensible method.

13.  $\frac{1}{2} = 0.5$ ,  $40\% = 0.4$ ,  
 $0.5 + 0.4 + 0.1 = 1$   
so  $\frac{1}{2}$ ,  $40\%$ , and  $0.1$  should be circled.

14. Amy is  $\frac{4}{5} \times 10 = \frac{40}{5} = 8$  years old.

Tina's mum is 4.25 times Amy's age.  
To find  $4.25 \times 8$ , first work out  $425 \times 8$ .

Method 1:

$$\begin{array}{r} 425 \\ \times \quad 8 \\ \hline 3400 \\ \quad 24 \\ \hline \end{array}$$

Method 2:

$\times$	8
400	3200
20	160
5	40
	3400

425 is 100 times bigger than 4.25,  
so Tina's mum is  $3400 \div 100 = 34$   
years old.

Give **2 marks** if the answer is **34**.  
Give **1 mark** if the answer is wrong but they've used a sensible method.

15. **1976**16a. **23**

16b. E.g.  $16 = 2 \times 8$  so to find  $368 \div 16$ ,  
divide  $368 \div 8 = 46$  by 2.

Give **1 mark** for any sensible explanation.

17a.  $27 \div 5 = 5 \text{ r } 2$ 

$$\text{So } \frac{27}{5} = 5\frac{2}{5}$$

17b.  $2\frac{4}{9} = \frac{2 \times 9}{9} + \frac{4}{9} = \frac{18 + 4}{9} = \frac{22}{9}$

18. Area of shaded parallelogram  
 $= 4 \times 12 = 48 \text{ mm}^2$   
Base of unshaded triangle  $= 7 - 4 = 3 \text{ mm}$   
Area of triangle  $= 0.5 \times 3 \times 12 = 18 \text{ mm}^2$   
Total area  $= 48 + 18 = 66 \text{ mm}^2$

Give **2 marks** if the answer is **66 mm<sup>2</sup>**.  
Give **1 mark** if the answer is wrong but they've got the area of the parallelogram or the triangle correct.

19a.  $\frac{1}{8}$ 

19b. **Sunday** should be ticked.  
E.g. She saw  $24 \div 4 = 6$  blackbirds on Sunday. Fewer than half the birds she saw on Saturday were blackbirds, so she saw fewer than  $12 \div 2 = 6$  blackbirds on Saturday.

Give **1 mark** if **Sunday** is ticked and there's a sensible explanation.

20. Total membership fees =  $10 \times \text{£}12 = \text{£}120$ .  
 The club buys  $4 \times 10 = 40$  balls.  
 20 balls cost  $\text{£}19.78$ ,  
 so 40 balls cost  $2 \times 19.78$ .  
 To find  $2 \times 19.78$ , first work out  $2 \times 1978$ .

Method 1:

$$\begin{array}{r} 1978 \\ \times \quad 2 \\ \hline 3956 \\ \phantom{3} \phantom{9} \phantom{5} \phantom{6} \\ \phantom{3} \phantom{9} \phantom{5} \phantom{6} \\ \hline \phantom{3} \phantom{9} \phantom{5} \phantom{6} \end{array}$$

Method 2:

$\times$	2
1000	2000
900	1800
70	140
8	16
	3956

1978 is 100 times bigger than 19.78,  
 so 40 balls cost  $3956 \div 100 = \text{£}39.56$

The club also buys 10 T-shirts.

Cost of 10 T-shirts =  $\text{£}4.99 \times 10 = \text{£}49.90$

Total cost of balls and T-shirts:

$$\begin{array}{r} \text{£} 39.56 \\ + \text{£} 49.90 \\ \hline \text{£} 89.46 \\ \phantom{\text{£}} \phantom{8} \phantom{9} \phantom{4} \phantom{6} \\ \phantom{\text{£}} \phantom{8} \phantom{9} \phantom{4} \phantom{6} \\ \hline \phantom{\text{£}} \phantom{8} \phantom{9} \phantom{4} \phantom{6} \end{array}$$

Money left over:

$$\begin{array}{r} \text{£} 120.00 \\ - \text{£} 89.46 \\ \hline \text{£} 30.54 \end{array}$$

Give **3 marks** if the answer is **£30.54**.

Give **2 marks** if the answer is wrong but they used a sensible method or if they worked out that the total cost of all the items is  $\text{£}89.46$ .

Give **1 mark** if they've worked out that 40 balls cost  $\text{£}39.56$  and 10 T-shirts cost  $\text{£}49.40$ .

## Set A Paper 3: Reasoning

Ask your teacher if you're not sure how many marks to give.

- 1a. **A and C**
- 1b. **A and B**
2. **110 300, 102 600, 102 514, 77 800**
- 3a.  $12 \times 4 = 48$
- 3b. There are  $3 + 4 + 1 = 8$  balloons in a packet. So she needs  $24 \div 8 = 3$  packets.
4. **Eight million, Eighty thousand, Eighty**
5.  $1.4 \text{ kg} = 1400 \text{ g}$   
 $1400 \text{ g} - 550 \text{ g} = 850 \text{ g}$   
 Give **2 marks** if the answer is **850 g**.  
 Give **1 mark** if the answer is wrong but they've used a sensible method.

6a.  $12 \text{ cm}^3$

6b.  $12 \times 3 = 36 \text{ cm}^3$

7. He eats  $21 \div 7 = 3$  apples each day.

To find how many apples he eats in 365 days, multiply 3 by 365.

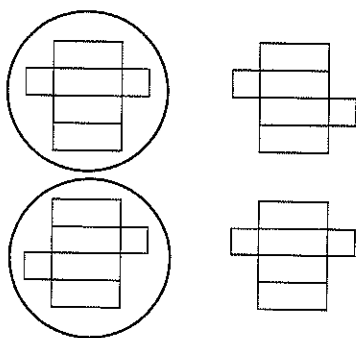
Method 1:
 
$$\begin{array}{r} 365 \\ \times 3 \\ \hline 1095 \\ 111 \end{array}$$

 Method 2:
 

$\times$	3
300	900
60	180
5	15
	1095

So he eats **1095** apples in 365 days.Give **2 marks** if the answer is **1095**.Give **1 mark** if the answer is wrong but they've used a sensible method.

8.



9a. **168**

9b. **458, 462, 464, 455**

10. Change =  $\pounds 2 + \pounds 2 + \pounds 0.20 + \pounds 0.05 = \pounds 4.25$   
 Cost of pencil case and 4 pencils  
 =  $\pounds 10 - \pounds 4.25 = \pounds 5.75$

4 pencils cost:

$$\begin{array}{r} \pounds 5.75 \\ - \pounds 2.95 \\ \hline \pounds 2.80 \end{array}$$

So one pencil costs  $\pounds 2.80 \div 4$   
 =  **$\pounds 0.70$  or 70p**

 Give **2 marks** if the answer is  **$\pounds 0.70$  or 70p**. Give **1 mark** if the answer is wrong but they've used a sensible method.

11a.  $8 \times 12 = 96$ ,  
 so  $80 \times 120 = 96 \times 100 = 9600$   
 So **nine thousand six hundred** should be ticked.

11b.  **$12 \times 800$  and  $8 \times 1200$**

12a. **10:56 (or 10.56 am)**

12b. **15 minutes**

12c. **10:22 (or 10.22 am)**

13a. **36**

13b.  $2 \text{ squared} + 4 \text{ squared} = 20$   
 (since  $2^2 = 4$  and  $4^2 = 16$ )

14. Number of loaves given away =  $1.5 \times 4 = 6$   
 If she sold two thirds, then one third were given away, so:

Number baked  $\div 3 = 6$

Number baked =  $6 \times 3 = 18$  loaves

Give **2 marks** if the answer is **18**.Give **1 mark** if the answer is wrong but they've used a sensible method.

15. Horizontal side of B = 4 units

Horizontal side of A = 2 units

So scale factor =  $4 \div 2 = 2$

16a.  $\frac{4}{5} \times \frac{2}{3} = \frac{4 \times 2}{5 \times 3} = \frac{8}{15}$

16b.  $\frac{1}{9} + \frac{1}{3} + ? = \frac{11}{18}$  can be written as:

$\frac{2}{18} + \frac{6}{18} + ? = \frac{11}{18}$

$? = \frac{3}{18} = \frac{1}{6}$

17. **False.**

E.g. 12 is a common multiple of 4 and 6.

Give **1 mark** if **False** is ticked and they've given a sensible explanation.

18.  **$R = A \div 3$  and  $A = 3R$**

19.  $1 - \frac{1}{9} = \frac{8}{9}$

$\frac{8}{9} \div 3 = \frac{8}{9 \times 3} = \frac{8}{27}$

Give **2 marks** if the answer is  **$\frac{8}{27}$** .Give **1 mark** if the answer is wrong but they've used a sensible method.

20. **Method 1:**  
You need two bottles for each litre.  
Each bottle costs £2.67 = 267p, so  
multiply 267 by 2 to find the cost of 1 litre:

$$\begin{array}{r} 267 \\ \times 2 \\ \hline 534 \\ 11 \end{array}$$

×	2
200	400
60	120
7	14
	534

So each litre costs 534p

4 litres cost:

$$\begin{array}{r} 534 \\ \times 4 \\ \hline 2136 \\ 11 \end{array}$$

×	4
500	2000
30	120
4	16
	2136

So 4 litres cost 2136p = **£21.36**

- Method 2:**  
4 litres = 4000 ml  
So they used  $4000 \div 500 = 40 \div 5 = 8$  bottles.  
Each bottle costs £2.67 = 267p,  
so multiply 267 by 8:

$$\begin{array}{r} 267 \\ \times 8 \\ \hline 2136 \\ 55 \end{array}$$

×	8
200	1600
60	480
7	56
	2136

So 4 litres cost 2136p = **£21.36**

Give 2 marks if the answer is **£21.36**.

Give 1 mark if the answer is wrong but they've used a sensible method.

## Set B Paper 1: Arithmetic

Ask your teacher if you're not sure how many marks to give.

1. **1016**

2. **646**

3. **4**

4. **0**

5. **828**

6. Method 1:

$$\begin{array}{r} 53 \\ \times 5 \\ \hline 265 \\ 1 \end{array}$$

Method 2:

×	5
50	250
3	15
	265

7. **-5**

8. **9.3**

9. 
$$\begin{array}{r} 25646 \\ + 7453 \\ \hline 33099 \\ 11 \end{array}$$

10. 
$$\begin{array}{r} \overset{4}{5} \overset{1}{4} \overset{1}{2} \overset{1}{1} \\ - 512 \\ \hline 4909 \end{array}$$

11. **8100**

12. **79 700**

13. Method 1:

$$\begin{array}{r} 316 \\ \times 7 \\ \hline 2212 \\ 14 \end{array}$$

Method 2:

×	7
300	2100
10	70
6	42
	2212

14. **7.422**

15.  $12 \times 3 = 36$

so  $120 \times 30 = 36 \times 100 = 3600$

16. 
$$\begin{array}{r} 176.28 \\ + 38.35 \\ \hline 214.63 \\ 11 \end{array}$$

$$17. \quad \begin{array}{r} 9 \ 2 \ 6 \\ 4 \overline{) 3 \ 7 \ 10 \ 24} \end{array}$$

$$18. \quad 121 \div 11 = 11$$

so  $1210 \div 11 = 11 \times 10 = 110$

$$19. \quad 0.04$$

$$20. \quad 3^3 + 5^2 = 27 + 25 = 52$$

$$21. \quad \begin{array}{r} 2 \overset{1}{\cancel{2}} \overset{2}{\cancel{3}} \overset{9}{\cancel{0}} \overset{1}{\cancel{0}} \\ - 5.03 \\ \hline 17.97 \end{array}$$

$$22. \quad \frac{5}{9} + \frac{6}{9} = \frac{11}{9} \text{ or } 1\frac{2}{9}$$

$$23. \quad \begin{array}{r} 4 \overset{2}{\cancel{2}} \overset{1}{\cancel{2}} \overset{1}{\cancel{3}} \overset{1}{\cancel{5}} \overset{1}{\cancel{0}} \overset{1}{\cancel{2}} \\ - 29574 \\ \hline 402888 \end{array}$$

$$24. \quad \begin{array}{r} \text{Method 1:} \quad \begin{array}{r} 5 \ 4 \ 2 \\ \times \quad 2 \ 3 \\ \hline 1 \ 6 \ 2 \ 6 \\ 1 \ 0 \ 8 \ 4 \ 0 \\ \hline 1 \ 2 \ 4 \ 6 \ 6 \end{array} \end{array}$$

Method 2:

$\times$	20	3
500	10 000	1500
40	800	120
2	40	6
	10 840	1626
	<b>12 466</b>	

Give 2 marks if the answer is 12 466.  
Give 1 mark if the answer is wrong but they've tried to use a correct method.

$$25. \quad 10\% \text{ of } 2200 = 2200 \div 10 = 220$$

$$30\% \text{ of } 2200 = 3 \times 220 = 660$$

$$26. \quad 4.38 \times 15 = 4.38 \times 10 + 4.38 \times 5$$

$$4.38 \times 10 = 43.8$$

$$4.38 \times 5 = 43.8 \div 2 = 21.9$$

$$\text{So } 4.38 \times 10 + 4.38 \times 5 = \begin{array}{r} 4 \ 3.8 \\ + 2 \ 1.9 \\ \hline 6 \ 5.7 \end{array}$$

$$27. \quad \frac{2}{3} - \frac{3}{21} = \frac{14}{21} - \frac{3}{21}$$

$$= \frac{14-3}{21} = \frac{11}{21}$$

$$28. \quad \text{Method 1:} \quad \begin{array}{r} 2 \ 3 \\ 18 \overline{) 4 \ 1 \ 4} \\ - 3 \ 6 \\ \hline 5 \ 4 \\ - 5 \ 4 \\ \hline 0 \end{array}$$

$$\text{Method 2:} \quad \begin{array}{r} 2 \ 3 \\ 18 \overline{) 4^4 1^5 4} \end{array}$$

Give 2 marks if the answer is 23.

Give 1 mark if the answer is wrong but they've tried to use a correct method.

$$29. \quad \text{Method 1:} \quad \begin{array}{r} 3 \ 5 \ 4 \ 2 \\ \times \quad 3 \ 8 \\ \hline 2 \ 8 \ 3 \ 3 \ 6 \\ 1 \ 0 \ 6 \ 2 \ 6 \ 0 \\ \hline 1 \ 3 \ 4 \ 5 \ 9 \ 6 \end{array}$$

Method 2:

$\times$	30	8
3000	90 000	24 000
500	15 000	4000
40	1200	320
2	60	16
	106 260	28 336
	<b>134 596</b>	

Give 2 marks if the answer is 134 596.  
Give 1 mark if the answer is wrong but they've tried to use a correct method.

$$30. \quad 10\% \times 20 = 20 \div 10 = 2$$

$$1\% \times 20 = 2 \div 10 = 0.2$$

$$40\% \times 20 = 4 \times 2 = 8$$

$$3\% \times 20 = 3 \times 0.2 = 0.6$$

$$43\% \times 20 = 8 + 0.6 = 8.6$$

$$31. \quad \frac{2}{5} \times \frac{1}{9} = \frac{2 \times 1}{5 \times 9} = \frac{2}{45}$$

$$32. \quad \text{Method 1:} \quad \begin{array}{r} 7 \ 4 \\ 35 \overline{) 2 \ 5 \ 9 \ 0} \\ - 2 \ 4 \ 5 \\ \hline 1 \ 4 \ 0 \\ - 1 \ 4 \ 0 \\ \hline 0 \end{array}$$

$$\text{Method 2:} \quad \begin{array}{r} 7 \ 4 \\ 35 \overline{) 2 \ 5^{25} 9^{14} 0} \end{array}$$

Give 2 marks if the answer is 74.

Give 1 mark if the answer is wrong but they've tried to use a correct method.



$$33. \quad \frac{3}{8} \div 3 = \frac{3}{8 \times 3} = \frac{3}{24} \text{ or } \frac{1}{8}$$

$$34. \quad 2\frac{2}{5} + 1\frac{2}{3} = \frac{12}{5} + \frac{5}{3}$$

$$= \frac{36}{15} + \frac{25}{15}$$

$$= \frac{36 + 25}{15}$$

$$= \frac{61}{15} \text{ or } 4\frac{1}{15}$$

$$35. \quad 10 \times 3\frac{2}{5}$$

$$= (10 \times 3) + (10 \times \frac{2}{5})$$

$$= 30 + 4 = 34$$

$$36. \quad 7 + 5 \times 8 = 7 + 40 = 47$$

## Set B Paper 2: Reasoning

Ask your teacher if you're not sure how many marks to give.

1. **47, 54, 45, 52**

2.  $23 + 18 - 11 = 30$

So the missing number in the first diagram is **30**.

$$13 + 22 - 15 = 20$$

So the missing number in the second diagram is **15**.

Give **1 mark** for **30** and **1 mark** for **15**.

3. 
$$\begin{array}{r} 16r4 \\ 7 \overline{) 1146} \end{array}$$

$$7 \overline{) 1146}$$

Each player gets 16 cards each with 4 cards left over.

Give **2 marks** if the answer is **4**.

Give **1 mark** if the answer is wrong but they've used a sensible method.

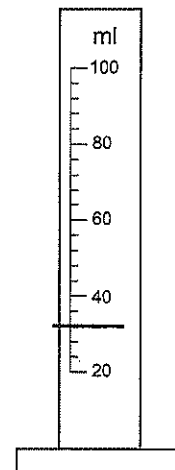
4a.  $60 - 10 = 50$

4b. **Monday, Wednesday and Thursday**

5a. **14 ml, 18 ml**

Give **1 mark** if both answers are correct.

5b. The line should be at  $14 + 18 = 32$  ml.  
Each gap on the scale is  $20 \div 5 = 4$  ml.



6. **0.3, 0.09, 0.002**

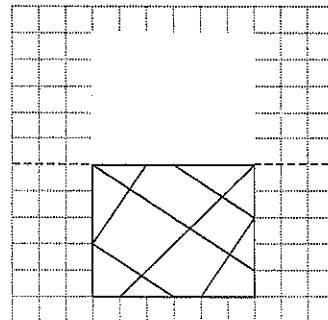
Give **2 marks** if they got all three answers right. Give **1 mark** if only two answers are right.

7.  $20:10 + 4 \text{ hours} = 00:10$

$$00:10 + 6 \text{ hours} = 06:10$$

$$6:10 + 12 \text{ minutes} = \mathbf{06:22}$$

8.



9. 11, 13, 17, 19

10. 5 kg = 5000 g

Divide this over 100 days:

$$5000 \div 100 = 50 \text{ g per day}$$

There are two bowls per day,  
so each bowl has  $50 \text{ g} \div 2 = 25 \text{ g}$ 

Give 2 marks if the answer is 25 g.

Give 1 mark if the answer is wrong but  
they've used a sensible method.11.  $2 + 8 + 2 + 3 + 2 + 8 + 2 +$   
 $(8 - 3) + 3 + (8 - 3) = 40 \text{ cm}$ 

12a. 0.91 and 0.09

12b. 0.08 and 0.02

13. 
$$\frac{18}{45} = \frac{18 \div 9}{45 \div 9} = \frac{2}{5}$$

So  $\frac{18}{45} = \frac{2}{5}$  is correct.14. One cheeseburger costs £4.95,  
so 4 cheeseburgers cost  $4.95 \times 4$ .To find this, first work out  $495 \times 4$ :

Method 1:

$$\begin{array}{r} 495 \\ \times \quad 4 \\ \hline 1980 \\ \phantom{1} \phantom{9} \phantom{8} \phantom{0} \\ \phantom{1} \phantom{9} \phantom{8} \phantom{0} \\ \hline 1980 \end{array}$$

Method 2:

$\times$	4
400	1600
90	360
5	20
	1980

495 is 100 times bigger than 4.95,  
so divide by 100:  $1980 \div 100 = 19.80$ .  
So 4 cheeseburgers cost £19.80.

Amount left from £25:

$$\begin{array}{r} \text{£ } 25.00 \\ - \text{£ } 19.80 \\ \hline \text{£ } 5.20 \end{array}$$

$$\text{£}2.60 \times 2 = \text{£}5.20,$$

so they can buy 2 large bottles.

Give 2 marks if the answer is 2.

Give 1 mark if the answer is wrong but  
they've used a sensible method.15.  $(9 \times 4) \div 3 = 12$ 

$$3 \times 8 - 2 = 22$$

Give 1 mark for 3 and 1 mark for 8.

16.

	Cube number	Not a cube number
Factor of 18	1	2, 3, 6, 9
Not a factor of 18	8	4

Give 2 marks if all the boxes are correct.

Give 1 mark if 2 or 3 boxes are correct.

17. Height of a stack =  $7 \times 0.4 = 2.8 \text{ m}$ 

Each small box =  $2.8 \div 10 = 0.28 \text{ m}$

Give 2 marks if the answer is 0.28 m.

Give 1 mark if the answer is wrong but  
they've used a sensible method.

18. Add up the days of rain:

$$\begin{array}{r} 165 \\ 161 \\ 173 \\ 163 \\ 167 \\ + 155 \\ \hline 984 \\ \phantom{9} \phantom{8} \phantom{4} \\ \phantom{3} \phantom{2} \end{array}$$

Divide by the number of years:

$$\begin{array}{r} 164 \\ 6 \overline{) 984} \end{array}$$

Mean = 164 days

Give 2 marks if the answer is 164.

Give 1 mark if the answer is wrong but  
they've tried to add up all the days and  
divide by the number of years.19. E.g. 7 is a factor of 14 ( $14 = 2 \times 7$ ),  
so it will always go into any multiple of 14.  
Give 1 mark for any sensible explanation.20.  $c = 15, f = 0$ 

$$c = 10, f = 1$$

$$c = 5, f = 2$$

$$c = 0, f = 3$$

Give 2 marks if they've got all four correct  
pairs of values. Give 1 mark if they've got  
two or three correct pairs of values.21.  $1 - \frac{4}{7} = \frac{3}{7}$  of the ice creams were vanilla.

$$\frac{3}{7} = 36, \text{ so } \frac{1}{7} = 36 \div 3 = 12$$

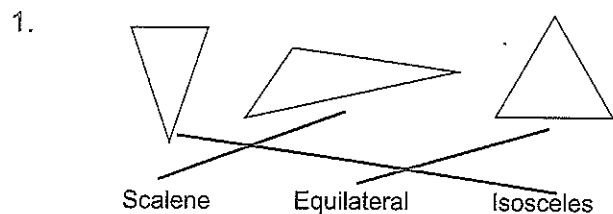
$$\text{Total sold} = 12 \times 7 = 84$$

Give 2 marks if the answer is 84.

Give 1 mark if the answer is wrong but  
they've used a sensible method.

# Set B Paper 3: Reasoning

Ask your teacher if you're not sure how many marks to give.

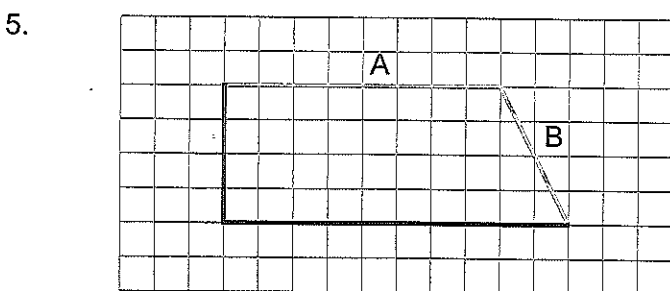


2. 
$$\begin{array}{r} 164 \\ + 357 \\ \hline 521 \\ \hline 11 \end{array}$$

3.  $243 \div 79 \approx 240 \div 80 = 3$

4a. **600**

4b. **0.07**



Give **2 marks** if the quadrilateral is correct.  
Give **1 mark** if the shape isn't correct but they've drawn a horizontal line from the end of line B or a vertical line down from the end of line A.

6a.  $\frac{5}{12}$

6b.  $\frac{3}{4}$  of 12 =  $(12 \div 4) \times 3 = 9$   
 $9 - 5 = 4$  more triangles need shading

7.  $255 \text{ cm} = 2.55 \text{ m}$   
The only pair of heights that add together to make 2.55 m are:  
Ali = **1.2 m** and Jack = **1.35 m**  
Give **1 mark** if they've got **both** heights correct.

8.  $0.68 \times 100 = 68$ ,  $96 - 29 = 67$   
so  $0.68 \times 100 > 96 - 29$

$\pounds 1.15 + 20\text{p} = 135\text{p}$ ,  $90\text{p} + 45\text{p} = 135\text{p}$   
so  $\pounds 1.15 + 20\text{p} = 90\text{p} + 45\text{p}$

$12 \times 5 = 60$ ,  $8^2 = 64$   
so  $12 \times 5 < 8^2$

Give **2 marks** if all the signs are correct.  
Give **1 mark** if two signs are correct.

9.  $3 \times 3 \times 3 = 27 \text{ m}^3$

10a. **5 mm**

10b. **25 seconds**

10c.  $45 - 35 = 10 \text{ mm}$

11. He has:  
 $\pounds 2 + \pounds 1 + \pounds 0.50 + \pounds 0.20 + \pounds 0.20 + \pounds 0.05$   
 $= \pounds 3.95 = 395\text{p}$

Divide by 35p to find how many he buys and how much money is left over.

Method 1:

$$\begin{array}{r} 11 \\ 35 \overline{) 395} \\ \underline{-35} \phantom{0} \\ 45 \\ \underline{-35} \\ 10 \end{array}$$

Method 2:

$$\begin{array}{r} 11 \text{ r } 10 \\ 35 \overline{) 395} \end{array}$$

So  $395\text{p} \div 35\text{p} = 11$  remainder 10  
So he buys 11 packs and has **10p** or **£0.10** change.

Give **2 marks** if the answer is **10p** or **£0.10**. Give **1 mark** if the answer is wrong but they've used a sensible method.

12.  $6.5 \times 4 = 26$   
 $26 + 58 = 84$   
 $84 \div 12 = 7$

Give **2 marks** if the answer is **7**.  
Give **1 mark** if the answer is wrong but they've used a sensible method.

13. There are  $4 \times 7 = 28$  tanks,  
each with 345 fish.  
Multiply to get the total number of fish.

Method 1:

$$\begin{array}{r} 345 \\ \times 28 \\ \hline 2760 \\ \phantom{27}34 \\ \hline 6900 \\ \phantom{69}1 \\ \hline 9660 \\ \phantom{966}1 \end{array}$$

Method 2:

×	20	8
300	6000	2400
40	800	320
5	100	40
	6900	2760
	9660	

So there are **9660** fish in total.

Give **2 marks** if the answer is **9660**.

Give **1 mark** if the answer is wrong  
but they've tried to multiply 345 by  
the number of tanks.

14a. **36 or 64**

14b.  $2 \times 3 \times 7 = 42$

Give **1 mark** if they've put **2, 3 or 7**  
in the boxes in any order.

15.  $\frac{20}{400} = \frac{5}{100} = 5\%$

16. Unmarked (top right) angle inside  
quadrilateral =  $360^\circ - 280^\circ = 80^\circ$   
Total of known angles inside quadrilateral  
=  $120^\circ + 90^\circ + 80^\circ = 290^\circ$

So angle h =  $360^\circ - 290^\circ = 70^\circ$

Give **2 marks** if the answer is **70°**.

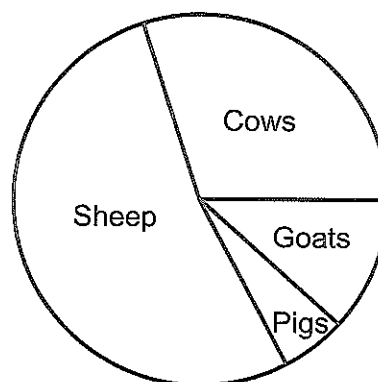
Give **1 mark** if the answer is wrong  
but they worked out that the  
unmarked angle is  $80^\circ$ .

17.  $a = 15 - 9 = 6$   
So,  $4a = 4 \times 6 = 24$

18. There are  $3 + 1 = 4$  shares.  
1 share is  $\pounds 20 \div 4 = \pounds 5$   
Hayley has  $3 \times \pounds 5 = \pounds 15$ ,  
Alex has  $1 \times \pounds 5 = \pounds 5$

Give **2 marks** if the answers are **£15** and  
**£5**. Give **1 mark** if they have one correct  
answer or if the answers are wrong but  
they've used a sensible method.

19.  $360^\circ \div 180 = 2^\circ$  per animal  
Cows:  $54 \times 2^\circ = 108^\circ$   
Sheep:  $95 \times 2^\circ = 190^\circ$   
Pigs:  $10 \times 2^\circ = 20^\circ$   
Goats:  $21 \times 2 = 42^\circ$



Give **2 marks** if their pie chart has  
all the correct angles and labels.

Give **1 mark** if their pie chart is wrong  
but they have two or three parts that  
have the correct angle and label.

20.  $1.281 \text{ kg} = 1281 \text{ g}$   
The marbles weigh a total of

$$\begin{array}{r} 1281 \\ - 236 \\ \hline 1045 \text{ g} \end{array}$$

Divide to find the weight of one marble:

Method 1:

$$\begin{array}{r} 27.5 \\ 38 \overline{) 1045.0} \\ \underline{- 76} \\ 285 \\ \underline{- 266} \\ 19.0 \end{array}$$

Method 2:

$$\begin{array}{r} 27.5 \\ 38 \overline{) 1045.0} \\ \underline{- 76} \\ 285 \\ \underline{- 266} \\ 19.0 \end{array}$$

So each marble weighs **27.5 g**

Give **3 marks** if the answer is **27.5 g**.

Give **2 marks** if the answer is wrong but  
they've tried to divide the total weight of the  
marbles by 38. Give **1 mark** if they only  
found the total weight of the marbles.