

Answers and Worked Solutions

PSLE Maths: Free Sample · 29 marks

Q	Question type	Answer	Marks
Q1	Ratio of three quantities	(2) 8 : 12 : 15	2
Q2	Two percentage changes in a row	(3) 96%	2
Q3	Average: removing a number	26	2
Q4	Algebra: substitution	8	2
Q5	Percentage with an unchanged quantity	80 members	4
Q6	Age problem: unchanged difference	7 years	4
Q7	Excess and shortage	74 stickers	4
Q8	Composite area: squares and circles	112 cm ²	4
Q9	Working backwards with transfers	360 stamps	5

How to mark

- Q1 to Q4: full marks for the correct answer.
- Q5 to Q9: a correct final answer earns full marks. If the final answer is wrong, give the step marks shown for each correct step.
- Equivalent working is accepted.

Q1
Paper 1 Ratio of three quantities

[2 marks]

$A : B = 2 : 3$ and $B : C = 4 : 5$. What is $A : B : C$ in its simplest form?

Answer: (2) 8 : 12 : 15

Worked solution

1. B is 3 parts in the first ratio and 4 parts in the second. Make B the same: the smallest common multiple of 3 and 4 is 12.
2. $A : B = 2 : 3 = 8 : 12$ (multiply both by 4).
3. $B : C = 4 : 5 = 12 : 15$ (multiply both by 3).
4. So $A : B : C = 8 : 12 : 15$.

Common mistakes

- **Option (1):** B became 12, which is 3×4 in the first ratio. So A must also be multiplied by 4: $2 \times 4 = 8$.

- **Option (3):** You added the same number to both parts of each ratio to make B = 12. Equivalent ratios come from MULTIPLYING (or dividing) both parts by the same number: $2 : 3 = 8 : 12$ and $4 : 5 = 12 : 15$.
- **Option (4):** You joined the two ratios directly. But B is 3 parts in the first ratio and 4 parts in the second. First make B the same: 12 parts.

Q2**Paper 1** Two percentage changes in a row**[2 marks]**

The price of a bicycle was increased by 20%. A month later, the new price was decreased by 20%. The final price is what percentage of the original price?

Answer: (3) 96%

Worked solution

1. Let the original price be 100%.
2. After the first change: $100\% + 20\% = 120\%$.
3. The decrease is 20% of the new price: $\frac{20}{100} \times 120\% = 24\%$.
4. Final price = $120\% - 24\% = 96\%$ of the original price.

Common mistakes

- **Option (1):** You did $100 + 20 - 20$. But the 20% decrease is 20% of the NEW price (120% of the original), not of the original price.
- **Option (2):** You only applied the 20% decrease to the original price. It was first increased by 20%, to 120%.
- **Option (4):** The size of the change is right (4%), but the final price is lower than the original. 20% of 120% is 24%, so the final price is $120\% - 24\% = 96\%$.

Q3**Paper 1** Average: removing a number**[2 marks]**

The average of 5 numbers is 18. When one of the numbers is removed, the average of the remaining numbers is 16. What is the number that was removed?

Answer: 26

Worked solution

1. Total of the 5 numbers = $5 \times 18 = 90$.
2. Total of the remaining 4 numbers = $4 \times 16 = 64$.
3. Number removed = $90 - 64 = 26$.

Common mistakes

- **Answer 2:** 2 is how much the AVERAGE dropped. Work with totals: total of 5 numbers = $5 \times 18 = 90$.
- **Answer 10:** You multiplied the drop (2) by 5. Compare the totals instead: $90 - 64$.
- **Answer 64:** 64 is the total of the remaining 4 numbers. Subtract it from the total of all 5 numbers.
- **Answer 90:** 90 is the total of all 5 numbers. Subtract the total of the remaining numbers (64).

Q4**Paper 1** Algebra: substitution**[2 marks]**

Find the value of $\frac{5y + 12}{3} - y$ when $y = 6$.

Answer: 8**Worked solution**

1. Top: $5y + 12 = 5 \times 6 + 12 = 42$.
2. Divide by 3: $42 \div 3 = 14$.
3. Subtract y : $14 - 6 = 8$.

Common mistakes

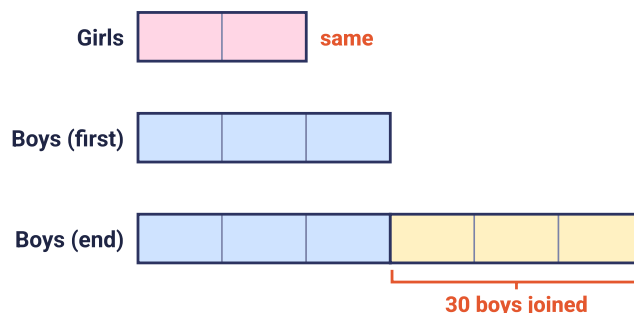
- **Answer 28:** The whole top ($5y + 12$) is divided by 3, not just the 12. Work out the top first: $5 \times 6 + 12 = 42$.
- **Answer 14:** $\frac{5y + 12}{3} = 14$ when $y = 6$. You still need to subtract y : $14 - 6$.
- **Answer 20:** The expression ends with $- y$, so subtract 6: $14 - 6$.

Q5**Paper 2** Percentage with an unchanged quantity**[4 marks]**

At first, 40% of the members of a chess club were girls. After 30 boys joined the club, 25% of the members were girls. No one left the club and no other members joined. How many members did the club have in the end?

Answer: 80 members**Worked solution**

1. At first, girls : boys = $40 : 60 = 2 : 3$. In the end, girls : boys = $25 : 75 = 1 : 3$.
2. The number of girls does not change, so make the girls the same: 2 units. At first girls : boys = $2 : 3$. In the end girls : boys = $2 : 6$.
3. The boys increased by $6 - 3 = 3$ units, which is 30 boys. So 1 unit = $30 \div 3 = 10$.
4. Girls = $2 \times 10 = 20$. Boys at first = $3 \times 10 = 30$. [1 mark each]
5. Members in the end = $(2 + 6) \times 10 = 80$. [2 marks]
6. Check: 20 out of 80 is 25%.

**Common mistakes**

- **Step 1 answer 200:** The percentage of girls dropped by 15%, but that drop is NOT 30 members, because the total also changed. Use units: girls stay the same.

- **Step 1 answer 2:** There are 2 units of girls. Now find the value of 1 unit.
- **Step 2 answer 60:** 60 is the number of boys at the END. Subtract the 30 boys who joined.
- **Step 2 answer 3:** There are 3 units of boys at first. Multiply by the value of 1 unit (10).
- **Final answer 50:** 50 is the number of members at FIRST. Add the 30 boys who joined.
- **Final answer 60:** 60 is the number of boys in the end. Add the girls too.
- **Final answer 200:** The 30 boys are not equal to the 15% drop, because the total changed too. Keep the girls the same and use units.

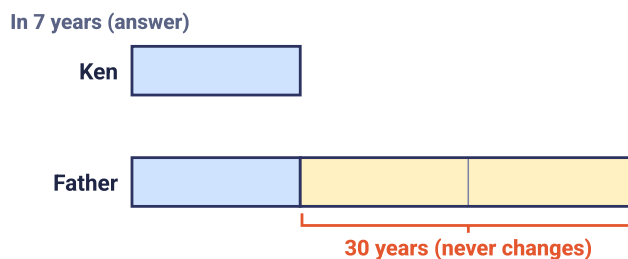
Q6**Paper 2** Age problem: unchanged difference**[4 marks]**

Ken is 8 years old and his father is 38 years old. In how many years' time will his father be 3 times as old as Ken?

Answer: 7 years

Worked solution

1. Difference in age = $38 - 8 = 30$ years. This difference never changes. [1 mark]
2. At that time, Ken is 1 unit and his father is 3 units. The difference is 2 units = 30 years, so 1 unit = $30 \div 2 = 15$. Ken will be 15. [1 mark]
3. Number of years = $15 - 8 = 7$. [2 marks]
4. Check: in 7 years, Ken is 15 and his father is $38 + 7 = 45 = 3 \times 15$.



Common mistakes

- **Step 1 answer 46:** You added their ages. The useful number is the DIFFERENCE: $38 - 8$.
- **Step 2 answer 10:** The father is 3 units and Ken is 1 unit, so the difference is $3 - 1 = 2$ units, not 3. 1 unit = $30 \div 2$.
- **Final answer 15:** 15 is how old Ken WILL be. The question asks in how many years: $15 - 8$.
- **Final answer 45:** 45 is the father's age at that time. The question asks how many years from now.
- **Final answer 2:** The difference (30) is 2 units, not 3.

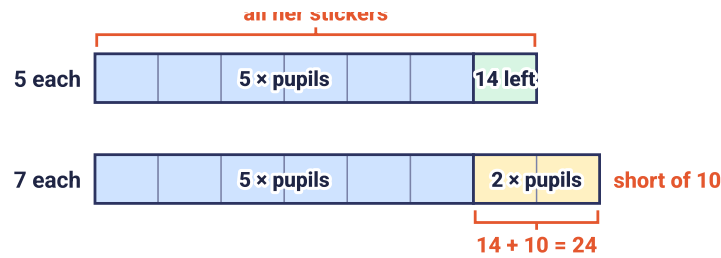
Q7**Paper 2** Excess and shortage**[4 marks]**

Mrs Tan has some stickers for her class. If she gives each pupil 5 stickers, she will have 14 stickers left. If she gives each pupil 7 stickers, she will be short of 10 stickers. How many stickers does Mrs Tan have?

Answer: 74 stickers

Worked solution

1. From the first case to the second case, the stickers needed go from 14 fewer than she has to 10 more than she has. Total difference = $14 + 10 = 24$. [1 mark]
2. Each pupil gets $7 - 5 = 2$ more stickers. Number of pupils = $24 \div 2 = 12$. [1 mark]
3. Stickers she has = $5 \times 12 + 14 = 74$. [2 marks]
4. Check with the second case: $7 \times 12 - 10 = 74$.



Common mistakes

- **Step 1 answer 4:** In one case there are 14 left over and in the other 10 are missing. The total gap between the two cases is $14 + 10$, not the difference.
- **Step 2 answer 2:** The gap is $14 + 10 = 24$, so the number of pupils is $24 \div 2$.
- **Final answer 84:** 84 stickers are NEEDED for 7 each, but she is short of 10. She has $84 - 10$.
- **Final answer 60:** 60 stickers are given out when each pupil gets 5. She also has 14 left over.
- **Final answer 94:** Being short means she has FEWER than she needs: $84 - 10$.
- **Final answer 12:** 12 is the number of pupils. Now find the number of stickers.

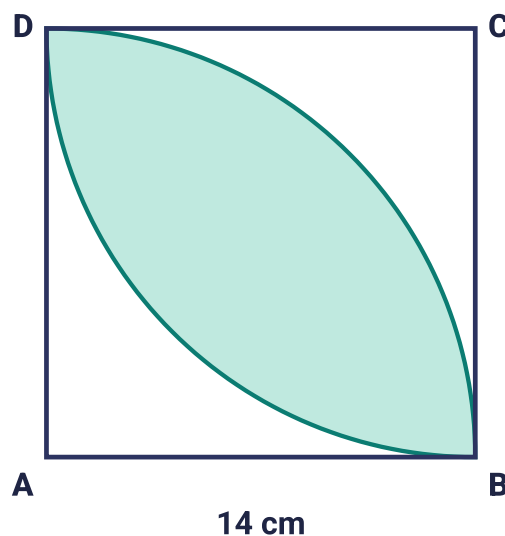
Q8

Paper 2 Composite area: squares and circles

[4 marks]

The figure shows a square ABCD of side 14 cm. Two quarter circles are drawn inside the square, one with centre A and the other with centre C. Find the area of the shaded part.

Take $\pi = \frac{22}{7}$.



The figure is not drawn to scale.

Answer: 112 cm²

Worked solution

1. Each quarter circle has radius 14 cm (the side of the square). Area = $\frac{1}{4} \times \frac{22}{7} \times 14 \times 14 = 154 \text{ cm}^2$. [1 mark]
2. Area of the square = $14 \times 14 = 196 \text{ cm}^2$. One unshaded corner = $196 - 154 = 42 \text{ cm}^2$. [1 mark]
3. There are two unshaded corners (near B and near D). Shaded part = $196 - 2 \times 42 = 112 \text{ cm}^2$. [2 marks]
4. Another way: the two quarter circles overlap on the shaded part, so shaded = $2 \times 154 - 196 = 112 \text{ cm}^2$.

Common mistakes

- **Step 1 answer 616:** That is the area of a WHOLE circle of radius 14 cm. A quarter circle is $\frac{1}{4}$ of it.
- **Step 1 answer 38.5:** The radius of each quarter circle is the side of the square (14 cm), because the centre is at a corner.
- **Step 1 answer 22:** That is the length of the curved edge. Area of a quarter circle = $\frac{1}{4} \times \pi \times r \times r$.
- **Step 2 answer 154:** That is the quarter circle. The unshaded corner is the square MINUS the quarter circle.
- **Step 2 answer 196:** 196 cm^2 is the whole square. Subtract the quarter circle (154 cm^2).
- **Final answer 308:** Two quarter circles together are 308 cm^2 , but they overlap: the shaded part is counted twice. Square – 2 unshaded corners is easier.
- **Final answer 42:** 42 cm^2 is ONE unshaded corner. There are two. Shaded = $196 - 2 \times 42$.
- **Final answer 84:** 84 cm^2 is the total UNSHADED area. Subtract it from the square.
- **Final answer 154:** One quarter circle is 154 cm^2 . The shaded part is only where the two quarter circles overlap.

Q9

Challenge Working backwards with transfers

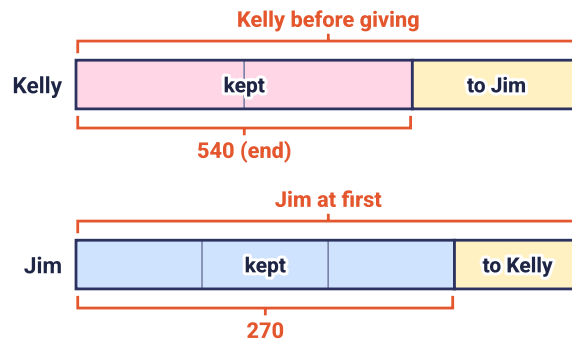
[5 marks]

Jim and Kelly had 1,080 stamps altogether. Jim gave $\frac{1}{4}$ of his stamps to Kelly. Then Kelly gave $\frac{1}{3}$ of the stamps she had to Jim. In the end, they had the same number of stamps. How many stamps did Jim have at first?

Answer: 360 stamps

Worked solution

1. The total stays 1,080. In the end each had $1,080 \div 2 = 540$. [1 mark]
2. Kelly kept $\frac{2}{3}$ of what she had: 2 units = 540, 1 unit = 270. Before giving, Kelly had $3 \times 270 = 810$. [1 mark]
3. At that moment Jim had $1,080 - 810 = 270$ (he had already given his stamps away). [1 mark]
4. Jim kept $\frac{3}{4}$ of his stamps: 3 units = 270, 1 unit = 90. Jim at first = $4 \times 90 = 360$. [2 marks]
5. Check: Jim $360 - 90 = 270$, Kelly $720 + 90 = 810$. Kelly gives 270: Jim 540, Kelly 540. Equal.



Common mistakes

- **Step 1 answer 1,080:** 1,080 is the total. In the end they have the SAME number, so each has half.
- **Step 2 answer 720:** Kelly gave away $\frac{1}{3}$ of what she had BEFORE giving, so what she kept (540) is $\frac{2}{3}$ of it. Before giving she had $540 \div 2 \times 3$.
- **Step 2 answer 360:** Work BACKWARDS: 540 is what Kelly kept, which is $\frac{2}{3}$ of what she had before giving.
- **Step 3 answer 540:** Jim received 270 stamps from Kelly, so before that he had $540 - 270$.
- **Step 3 answer 810:** Working backwards, undo the gift: Jim had $540 - 270$ before Kelly gave him stamps.
- **Final answer 720:** 720 is what KELLY had at first. Jim had $1,080 - 720$.
- **Final answer 270:** 270 is what Jim had AFTER giving away $\frac{1}{4}$ of his stamps. That is $\frac{3}{4}$ of what he had at first.
- **Final answer 540:** 540 is what each person had at the END. Work backwards two steps.

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