

MATH · Y6

Year 6 Reasoning Pack

SATs-style preparation across all topics

Set 1: Fluency

1. What is $1,234 \times 23$?
2. What is $4,758 \div 6$?
3. What is $\frac{3}{5} + \frac{2}{3}$?
4. What is 2.4×1.5 ?
5. Find 35% of 240.
6. Solve: $4x + 6 = 26$.
7. What is $2^3 + 3^2$?
8. Convert $\frac{5}{8}$ to a decimal.
9. Find the area of a triangle base 12cm, height 8cm.
10. What is 60% as a fraction in simplest form?

Set 2: Reasoning

1. Sam says $5^2 + 3^2 = 8^2$. Is he right? Show why.
2. Two numbers have a product of 144 and a sum of 25. What are they?
3. Which is bigger: $\frac{5}{8}$ or 60%? By how much?
4. A cube has surface area 96cm^2 . What is its volume?



5. 5. The mean of four numbers is 12. Three of the numbers are 9, 11 and 14. What is the fourth?
6. 6. The angles in a quadrilateral are in ratio 1:2:3:4. Find each angle.
7. 7. n is a 2-digit number. n is even, divisible by 5, and the digits add to 7. What is n ?
8. 8. Sam says 'the bigger the denominator, the smaller the fraction'. Is this always true? Give an example.
9. 9. A line passes through (1,2) and (3,8). What is the gradient?
10. 10. Solve: $3(x - 4) = 18$.

Set 3: Problem solving

1. 1. A school has 480 children. $\frac{5}{8}$ are in KS2. Of those in KS2, 40% are in Year 6. How many Year 6 children?
2. 2. A bag of sweets contains 30 sweets in ratio 2:3:5 of red:green:yellow. How many of each?
3. 3. After spending 25% of her money on lunch and $\frac{1}{3}$ of what's left on a book, Sara has £15. How much did she start with?
4. 4. A train left at 11:48 and arrived at 14:23. The journey was 215km. What was the average speed in km/h (to nearest whole)?
5. 5. A swimming pool is 25m by 10m by 1.5m deep. How many cubic metres of water does it hold? If $1\text{m}^3 = 1000$ litres, how many litres?
6. 6. The mean weight of 5 children is 32kg. A 6th child joins them and the new mean is 33kg. What is the 6th child's weight?
7. 7. Two numbers are in ratio 3:7. The bigger is 28 more than the smaller. What are the numbers?
8. 8. A rectangle has perimeter 40cm. The length is 4cm more than the width. Find the dimensions and area.
9. 9. A teacher buys 24 pencils at £0.45 each, then sells them for £0.60 each. What is her profit if she sells all 24?
10. 10. The first three terms of a sequence are 3, 7, 11. What is the 50th term?



Answer key

Set 1: 1. 28,382 2. 793 3. $19/15$ ($1\frac{4}{15}$) 4. 3.6 5. 84 6. $x=5$ 7. 17 8. 0.625 9. 48cm^2 10. $3/5$

Set 2: 1. No — $25 + 9 = 34$, not 64. Counterexample to a Pythagoras-style misreading. 2. 16 and 9. 3. $5/8 = 62.5\%$, so $5/8$ is bigger by 2.5%. 4. Each face = 16cm^2 , side = 4cm, volume = 64cm^3 . 5. Sum = 48, fourth = 14. 6. Total 360° , parts 10. Each part 36° . Angles: 36° , 72° , 108° , 144° . 7. 70 ($7+0=7$, even, divisible by 5). 8. Only true if numerators are equal. $1/2 < 7/8$ contradicts the claim. 9. Gradient = $(8-2)/(3-1) = 3$. 10. $x = 10$.

Set 3: 1. 120 (300 in KS2, $40\% = 120$). 2. 6 red, 9 green, 15 yellow. 3. Final $\pounds 15 = 2/3$ of remainder. So remainder = $\pounds 22.50$. That's 75% of original. Original = $\pounds 30$. 4. 2h 35m = 2.583h. Speed $\approx 215 \div 2.583 \approx 83$ km/h. 5. $375\text{m}^3 = 375,000$ litres. 6. New total = $33 \times 6 = 198$. Previous total = $32 \times 5 = 160$. Sixth = 38kg. 7. Difference = 4 parts = 28, so each part = 7. Numbers are 21 and 49. 8. Width 8, length 12. Area 96cm^2 . 9. Cost $\pounds 10.80$, revenue $\pounds 14.40$, profit $\pounds 3.60$. 10. Term $n = 3 + 4(n-1)$. 50th = $3 + 196 = 199$.

