

5 MUST KNOW QUESTIONS TO CONQUER

RATIO AND RATE

1	<p>A playpen contains red, blue and yellow balls.</p> <p>The ratio of red to blue balls is 3: 5 and the ratio of blue to yellow balls is 7: 2.</p> <p>If 20 blue balls are added, the ratio of red to blue balls will become 7: 15.</p> <p>Calculate the number of yellow balls in the playpen.</p>	[3]
2	<p>A lorry travels 48 km at a speed of 54 km/h from Changi to Jurong.</p> <p>(a) Express this speed in m/s.</p> <p>(b) Find the time taken for the lorry to travel from Changi to Jurong in minutes and seconds.</p> <p>(c) The lorry then travelled 37 km from Jurong to Bedok in 36 minutes 40 seconds. Find the average speed of the lorry in km/h, for its journey from Changi to Bedok. Correct your answer to 3 significant figures.</p>	[3] [3] [4]
3	<p>Melisa is travelling from Singapore to Hong Kong.</p> <p>In Singapore, the exchange rate is 1 Singapore Dollar = 5.727 Hong Kong Dollars.</p> <p>In Hong Kong, the exchange rate is 1 Hong Kong Dollar = 0.175 Singapore Dollars.</p> <p>Melisa wants to exchange 350 Singapore Dollars into Hong Kong Dollars.</p> <p>By showing your working clearly, justify whether she should change the money in Hong Kong or Singapore.</p>	[2]
4	<p>Adam, Ben, and Cayden share a sum of money. The ratio of Adam's money to Ben's is in the ratio 3:5. Cayden has 1.5 times the money that Ben has.</p> <p>(a) Find the ratio of Adam's money to Ben's money to Cayden's money.</p> <p>(b) If Cayden has \$90 more than Adam, find the total amount of money the three of them have.</p>	[2] [2]
5	<p>Harry drives at an average speed of x km/h for half an hour and then for another 20 minutes at an average speed of $1.2x$ km/h.</p> <p>(a) Find the distance travelled, in km, in the first half an hour. Give your answer in terms of x.</p> <p>(b) Show that the total distance travelled for the whole journey is $0.9x$ km.</p> <p>(c) Given that the average speed for the entire journey was 80 km/h, from an equation in x and solve the equation.</p> <p>(d) Harry says that he will reach his destination earlier if he drives at a constant speed of 80 km/h. Is his statement reasonable? Explain your answer.</p>	[1] [1] [4] [2]

Answer Key

1	Original red: blue: yellow = 21: 35: 10 New red: blue 21: 45 $45 - 35 = 10$ units = 20 balls Number of yellow balls = 10 units = 20 Ans: 20
2	Solutions: (a) $\frac{54km}{1hr} = \frac{54000m}{60mins}$ $\frac{54000m}{60mins} = \frac{54000m}{60 \times 60secs}$ $\frac{54000m}{60mins} = \frac{54000m}{3600s}$ $= 15m/s$ (b) Time taken = $\frac{48km}{\frac{15m}{s}}$ Time taken = $\frac{48km}{\frac{15m}{s}}$ $= 3200seconds$ $= \frac{3200}{60} minutes$ $= 53\frac{1}{3} minutes$ $= 53mins 20secs$ (c) Total time taken from Changi to Jurong to Bedok $= 53min20s + 36min40s$ $= 90mins$ $= 1.5hrs$ Total distance = $48 + 37 = 85km$ Average speed = $\frac{85km}{1.5hr}$ $= 56.7 km/h$ (3 s.f) Ans: (a) 15m/s (b) 53mins 20secs (c) 56.7km/h (3s.f)
3	Solution: $S\$350 = 350 \times 5.727 = HK\2004.45 $\frac{S\$350}{0.175} = HK\2000 $2004.45 - 2000 = HK\$4.45$ Ans: Melisa should change money in Singapore as she will get HK\$4.45 more than when she changes in Hong Kong.
4	Solutions: (a) A: B: C 3: 5 2: 3 6: 10: 15 (b) \$90 is $15 - 6 = 9$ parts $1part = \$10$ Total = 31 parts Total amount = \$310 Ans: (a) 6: 10: 15 (b) \$310

5 Solutions:

(b) Total distance travelled: $\frac{1}{2}x + 0.4x$
 $= 0.9x$ (shown)

(c) $0.9x \div \frac{5}{6} = \frac{27}{25}x$
 $\frac{27}{25}x = 80$
 $x = 80 \div \frac{27}{25}$
 $x = 74.074$
 $x = 74.1$

Ans: (a) $\frac{1}{2}x$ (b) $0.9x$ (shown) (c) $x = 74.1$ (d) Statement is not reasonable as e.g., Car starts from 0 km/h. e.g., Car will have to stop at traffic junctions or *equivalent explanations*.