

Secondary 1 WA3 Mock Exam

Hello my beloved Sec 1s!

Dylan here!

I have created these mock tests for y'all as I found out that I had lack of practice questions when I was in Secondary School.

The difference in the standards between the homework and test questions are way too different.

When my students sit through a Mock Exam prior to their tests, they get use to the time pressure, and they get exposed to the level of the exam questions.

That is the reason why they score really well.

I have a strong desire to help as many students as possible in this community and I want you guys to perform to your best ability.

That is why I want to share these resources with everyone here.

I have purposefully selected questions that cover different scopes in the chapters.

Yes! If you can do these questions, you can certainly do well in your WA3!

Take this test in a quiet environment.




Answers are included at the back, so please don't refer :)

Jiayou!

Love,

Dylan

Number Patterns

1	<p>A sequence of patterns formed by dots is as shown.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start; text-align: center;"> <div style="margin: 10px;"> <p><u>Pattern 1</u></p>  <p>Number of dots = 1</p> </div> <div style="margin: 10px;"> <p><u>Pattern 2</u></p>  <p>Number of dots = 5</p> </div> <div style="margin: 10px;"> <p><u>Pattern 3</u></p>  <p>Number of dots = 9</p> </div> <div style="margin: 10px;"> <p><u>Pattern 4</u></p> <div style="border: 1px solid black; width: 100px; height: 100px; margin: 0 auto;"></div> </div> </div> <p>(a) Draw the 4th pattern of the sequence in the above box. [1]</p> <p>(b) State the total number of dots required, in terms of n, to form the n^{th} pattern? [2]</p> <p>(c) Pattern P requires 333 dots. What is the value of 'P'? [2]</p>
2	<p>Given the following sequence,</p> $\frac{1}{6} + \frac{1}{3} = \frac{1}{2}$ $\frac{1}{12} + \frac{1}{4} = \frac{1}{3}$ $\frac{1}{20} + \frac{1}{5} = \frac{1}{4}$ $\frac{1}{30} + \frac{1}{6} = \frac{1}{5}$ $\frac{1}{p} + \frac{1}{12} = \frac{1}{11}$ <p>Find</p> <p>(a) the 5th line of sequence, [1]</p> <p>(b) the value of p, [1]</p> <p>(c) the value of $\frac{1}{98} - \frac{1}{99}$, showing your workings clearly. [2]</p>

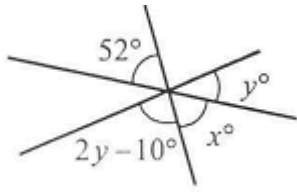
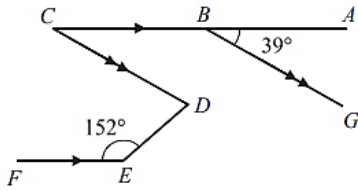
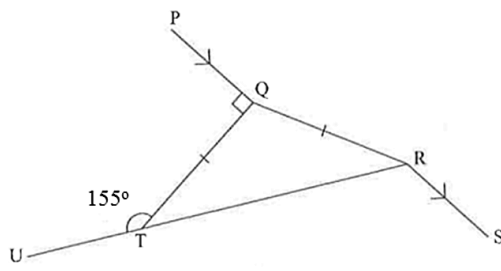
Ratio, Rate, Speed

1	<p>A recipe to bake 20 muffins states that the ratio of flour and milk needs to be 5:3.</p> <p>(a) If Nancy uses 200ml of flour, calculate how much milk she needs. [2]</p> <p>(b) If baking 20 muffins require 400ml of flour, calculate the amount of milk required if Nancy wants to bake 50 muffins. [3]</p>																
2	<p>Mr Sim changed \$3600 Singapore Dollars (S\$) into US Dollars (USD) for his trip to New York City. Upon returning, he had 800 USD left. Given that the currency exchange rate is S\$1 to 0.71 USD.</p> <p>(a) Find out how much USD did Mr Sim get at first. [1]</p> <p>(b) Mr Sim wants to exchange his remaining USD back to Singapore Dollars. Calculate the amount of Singapore Dollars he will get back. Give your answers to the nearest Singapore Dollars. [1]</p>																
3	<p>A triathlon is a race where an athlete needs to complete 3 different segments, swimming, cycling and running. Cindy took part in a triathlon and her performance for each segment is recorded below.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Race segment</th> <th>Timing</th> <th>Distance</th> <th>Speed</th> </tr> </thead> <tbody> <tr> <td>Swimming</td> <td>$\frac{5}{6}$ hrs</td> <td>1.5 km</td> <td>a km/h</td> </tr> <tr> <td>Cycling</td> <td>30 mins</td> <td>b km</td> <td>25 km/h</td> </tr> <tr> <td>Running</td> <td>c hrs</td> <td>8 km</td> <td>10 km/h</td> </tr> </tbody> </table> <p>(a) Find the values of a, b and c. [3]</p> <p>(b) Determine Cindy's average speed for the whole race, giving your answer in km/h. [2]</p>	Race segment	Timing	Distance	Speed	Swimming	$\frac{5}{6}$ hrs	1.5 km	a km/h	Cycling	30 mins	b km	25 km/h	Running	c hrs	8 km	10 km/h
Race segment	Timing	Distance	Speed														
Swimming	$\frac{5}{6}$ hrs	1.5 km	a km/h														
Cycling	30 mins	b km	25 km/h														
Running	c hrs	8 km	10 km/h														
4	<p>Tigreal spent x hours per day to revise for his examinations. He spent $\frac{1}{6}$ of his revision time on Geography, $\frac{1}{5}$ of his remaining revision time on English, $\frac{1}{4}$ of the remaining revision time after English on Biology and then spent the last 40 minutes on Mathematics. Giving each answer in its simplest form, find an expression, in terms of x, for the time Tigreal spent revising for</p> <p>(a) (i) Biology [3] (ii) Mathematics [2]</p> <p>(b) Hence, find the value of x. [1]</p>																


Percentage

1	<p>Kale ordered one set meal at \$55.60 and an ice cream for \$12.90 at a restaurant. Below shows Kale's bill before payment.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>1 set meal</td> <td style="text-align: right;">\$55.60</td> </tr> <tr> <td>Ice cream</td> <td style="text-align: right;">\$12.90</td> </tr> <tr> <td>SUBTOTAL</td> <td style="text-align: right;">\$68.50</td> </tr> <tr> <td>10% Service Charge</td> <td style="text-align: right;">\$6.85</td> </tr> <tr> <td>7 % Goods and Services Tax (GST)</td> <td style="text-align: right;">\$5.27</td> </tr> </table> <p>Currently, the restaurant is offering two discount packages that Kale can choose from.</p> <p><u>Discount Package I:</u> Enjoys 10% off the subtotal of the bill, which is thereafter subjected to 10% Service Charge first and then 7% GST.</p> <p><u>Discount Package II:</u> There is no service charge and the subtotal is subjected to 7% GST.</p> <p>Explain, showing all necessary working, which discount package is a better option for Kale. [5]</p>	1 set meal	\$55.60	Ice cream	\$12.90	SUBTOTAL	\$68.50	10% Service Charge	\$6.85	7 % Goods and Services Tax (GST)	\$5.27
1 set meal	\$55.60										
Ice cream	\$12.90										
SUBTOTAL	\$68.50										
10% Service Charge	\$6.85										
7 % Goods and Services Tax (GST)	\$5.27										
2	<p>Ben owns a bakery, selling croissants and fruit tarts. On a certain day, he sold a total of 575 croissants and fruit tarts. If he sold 30% more croissants than fruit tarts on that day, how many croissants and tarts did he sell? [3]</p>										

Angles and Polygons

<p>1</p>	<p>In the figure, three straight lines intersect at a point. Giving your reasons clearly, find the values of</p> <div style="text-align: center;">  </div> <p>(a) x, [1] (b) y. [2]</p>
<p>2</p>	<p>In the figure, angle $ABG = 39^\circ$, angle $FED = 152^\circ$, $AC \parallel EF$ and B is a point on AC such that $BG \parallel CD$.</p> <div style="text-align: center;">  </div> <p>Giving your reasons, find (a) reflex angle ACD, [2] (b) acute angle CDE. [3]</p>
<p>3</p>	<p>In the diagram, UTR is a straight line and TQR is an isosceles triangle such that $QT = QR$. Given that $PQ \parallel RS$, $\angle UTQ = 155^\circ$ and $\angle PQT = 90^\circ$, find</p> <div style="text-align: center;">  </div> <p>(a) $\angle TQR$, [3] (b) $\angle TRS$. [3]</p>

Answer Key
Number Patterns

1		(b) $4n - 3$ $T_1 = 1 = 4(1) - 3$ $T_2 = 5 = 4(2) - 3$ $T_3 = 9 = 4(3) - 3$ $T_4 = 13 = 4(4) - 3$ $T_n = 4n - 3$	(c) 84 $T_p = 4p - 3 = 333$ $4p = 336$ $p = 84$
2	(a) $\frac{1}{42} + \frac{1}{7} = \frac{1}{6}$ (b) $p = 132$	(c) $\frac{1}{99 \times 98} + \frac{1}{99} = \frac{1}{98}$ $\frac{1}{98} - \frac{1}{99} = \frac{1}{99 \times 98}$ $= \frac{1}{9702}$	

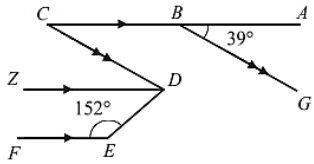
Ratio Rate Speed

1	(a) 5 units – 200 ml 1 unit – 40 Milk needed = $3 \times 40 = 120$ ml	(b) 20 muffins need 400ml of flour Hence, 50 muffins need = $\frac{400}{20} \times 50 = 1000$ ml of flour. For 1000 ml of flour, milk needed $= \frac{1000}{5} \times 3 = 600$ ml	
2	(a) Since S\$1 to 0.71USD $S\$3600 = 3600 \times 0.71 = 2556$ USD Hence, Mr Sim got 2556 USD	(b) Leftover = 800 USD Hence, amount of SGD he got back $= \frac{800}{0.71} = S\$1126$	
3	(a) $a = 1.5 \div \frac{5}{6} = 1.8$ km/h $b = 0.5 \text{ hrs} \times 25 = 12.5$ km and $c = 8 \div 10 = 0.8$ hrs	(b) Cindy's average speed $= \frac{1.5 + 12.5 + 8}{\frac{5}{6} + 0.5 + 0.8} = \frac{22}{2\frac{2}{15}} \approx 10.3$ km/h (3s.f.)	
4	(a) (i) Let x be the total time spent for the study period. Time spent on Geography = $\frac{x}{6}$ h Time spent on English = $\frac{1}{5} \left(x - \frac{x}{6} \right) = \frac{x}{6}$ h Time spent on Biology $= \frac{1}{4} \left(x - \frac{x}{6} - \frac{x}{6} \right) = \frac{x}{6}$ h (ii) Time spent on Mathematics $= x - \frac{x}{6} - \frac{x}{6} - \frac{x}{6} = \frac{x}{2}$ h		

Percentage

1	Discount Package I: Bill subjected to Service Charge and GST = $90\% \times \$68.50$ $= \$61.65$ Total amount paid in Discount Package I = $(110\% \times \$61.65) \times 1.07$ $= \$72.56$ Discount Package II: Bill subjected to GST = $\$68.50$ Total amount paid in Discount Package II = $\$68.50 \times 1.07$ $= \$73.30$ Since amount paid in Package II is more than amount paid in Package I, therefore Package I is a better option for Kale.
2	13 units – Croissants 10 units - Fruit tarts 23 units – 575 1 unit = 25 No. of Croissants = $25 \times 13 = \mathbf{325}$ No. of fruit tarts = $25 \times 10 = \mathbf{250}$

Angles and Polygons

1	(a) $x = 52^\circ$ (vert opp \angle s)	(b) $x + y + 2y - 10^\circ = 180^\circ$ (adj \angle s on a str line) $52^\circ + 3y - 10^\circ = 180^\circ$ $3y = 180^\circ - 42^\circ$ $= 138^\circ$ $y = 46^\circ$ [A1]
2	(a) $\angle BCD = 39^\circ$ (corr. \angle s) Reflex $\angle ACD = 360^\circ - 39^\circ$ (\angle s at a point) $= 321^\circ$	(b)  <p>Draw line $ZD \parallel$ to FE and CA.</p> $\angle CDZ = 39^\circ$ (alt. \angle s) $\angle EDZ = 180^\circ - 152^\circ$ (int \angle s) $= 28^\circ$ $\angle CDE = 39^\circ + 28^\circ = 67^\circ$
3	(a) $\angle QRT = 180^\circ - 155^\circ = 25^\circ$ (adj \angle s on a str. line) $\angle QRT = \angle QTR = 25^\circ$ (base \angle s of isos. tri) $\angle TQR + 25^\circ + 25^\circ = 180^\circ$ (\angle sum of tri) $\angle TQR = 130^\circ$	(b) $\angle PQR + 90^\circ + 130^\circ = 360^\circ$ (\angle s at a pt) $\angle PQR = 140^\circ$ $\angle QRS = \angle PQR = 140^\circ$ (alt \angle s, $PQ \parallel RS$) $\angle TRS = 140^\circ - 25^\circ = 115^\circ$