

**Secondary One Express Mathematics**

**End of Year Examination Paper 1**

<b>Marks</b>	<b>50</b>
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1. Using a calculator, evaluate  $\sqrt{\frac{8^2 - 21.3}{43\frac{6}{7} - 26.08}}$  correct to 2 decimal places.

Ans: \_\_\_\_\_ [1]

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2. (a) Express  $\frac{4}{11}$  as a recurring decimal.  
(b) Evaluate  $2.81 \div 49$  correct to 3 significant figures.

Ans: (a) \_\_\_\_\_ [1]

(b) \_\_\_\_\_ [1]

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- 3 (a) Find the possible values of  $x$  for which  $\frac{2}{3}x > -2$  if  $x$  is a negative integer.  
(b) Find the possible values of  $y$  for which  $2y \leq 18$  if  $y$  is a square number.

Ans: (a) \_\_\_\_\_ [2]

(b) \_\_\_\_\_ [2]

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- 4 (a) Express 540 as a product of prime factors,  
(b) Find the value of  $n$  such that  $540n$  is perfect cube.

Ans: (a) \_\_\_\_\_ [2]

(b) \_\_\_\_\_ [1]

- 5 A sum of money is divided among Alan, Ben and Charles. The ratio of the amount of money received by Alan to the amount received by Ben is 2 : 7, and the ratio of the amount of money received by Ben to the amount received by Charles is 5 : 4.
- (a) What is the ratio of the amount of money received by Alan to the amount received by Charles?
- (b) If Ben receives \$140, calculate the total amount of money shared among the three boys.

Ans: (a) \_\_\_\_\_ [2]

(b) \$ \_\_\_\_\_ [2]

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- 6 Convert
- (a) 23 km/h to m/s, leaving your answer as a fraction.
- (b) 235 cm<sup>2</sup> into m<sup>2</sup>.

Ans: (a) \_\_\_\_\_ m/s [2]

(b) \_\_\_\_\_ m<sup>2</sup> [1]

7 Given that  $x = 4$ ,  $y = -2$  and  $z = \frac{1}{3}$ , find the value of

(a)  $x^2 - 2y + 8z$ ,

(b)  $\frac{7x + 2z}{y}$ .

Leave your answers in mixed numbers.

Ans: (a) \_\_\_\_\_ [2]

(b) \_\_\_\_\_ [2]

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8 Simplify the following expressions:

(a)  $13x - 5y - 6x + 8y$

(b)  $2(a - 5) + 7(3 - 2a)$

(c)  $\frac{x+3}{2} - \frac{2x+1}{5}$

Ans: (a) \_\_\_\_\_ [1]

(b) \_\_\_\_\_ [2]

(c) \_\_\_\_\_ [2]

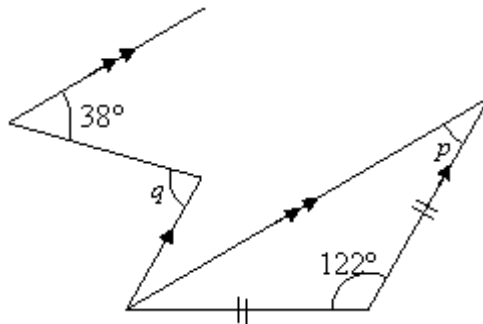
9 A farmer has  $x$  tomato plants. He intends to apply 250 ml of liquid fertiliser to each plant. The fertiliser is sold in containers each holding 5 000 ml and costing \$135 each.

- (a) Write down an expression, in terms of  $x$ , for the number of containers of fertiliser he must buy and simplify it.
- (b) If the total cost of the fertiliser is \$810, form an equation in  $x$  and solve it.

Ans: (a) \_\_\_\_\_ [2]

(b) \_\_\_\_\_ [2]

10. Find the values of  $p$  and  $q$  in the diagram below.



Ans:  $p =$  \_\_\_\_\_  $^\circ$  [1]

$q =$  \_\_\_\_\_  $^\circ$  [2]

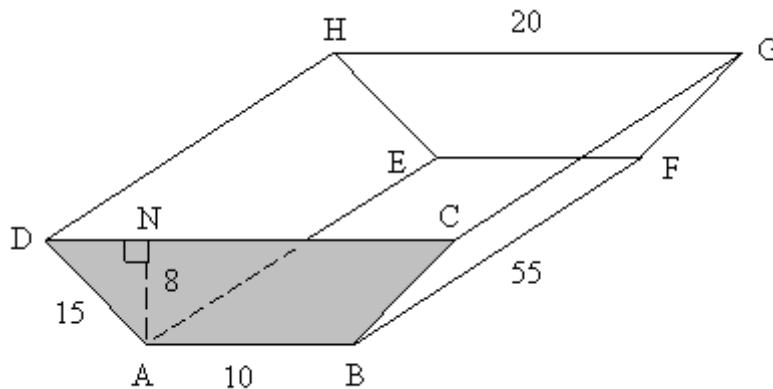
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- 11 (a) Three of the angles of a quadrilateral are each  $95^\circ$ . Find the fourth angle.  
 (b) Each interior angle of a regular polygon is  $150^\circ$ . Calculate the number of sides of the polygon.

Ans: (a) \_\_\_\_\_ $^\circ$  [1]

(b) \_\_\_\_\_ [2]

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- 12 The figure not drawn to scale, shows a solid with 6 sides.



If  $AB = 10$  cm,  $BC = AD = 15$  cm,  $CD = 20$  cm,  $BF = 55$  cm and  $AN = 8$  cm, find

- (a) the area of ABCD,  
 (b) the volume of the tray  
 (c) the external surface area of the tray

Ans: (a) \_\_\_\_\_  $\text{cm}^2$  [2]

(b) \_\_\_\_\_  $\text{cm}^3$  [1]

(c) \_\_\_\_\_  $\text{cm}^2$  [2]

- 13 The diagram below shows the first three of a sequence of figures. Each figure consists of a number of small right-angled triangles. A dot is placed at each point where there is a corner of one or more triangles.

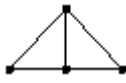


Figure 1

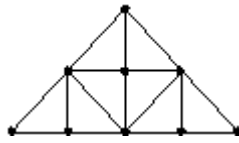


Figure 2

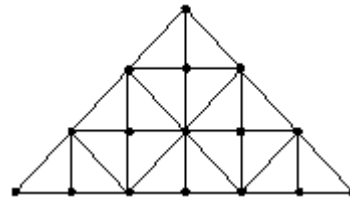


Figure 3

The total number of dots and the number of small right-angled triangles in each figure is shown in the following table.

Figure	Total number of dots	Number of small right-angled triangles
1	4	2
2	9	8
3	16	18
4	$r$	$s$
-	-	-
.	.	.
.	.	.
$n$	?	?

- (a) Find the values of  $r$  and  $s$ .  
 (b) Write down an algebraic expression for the total number of dots for the figure  $n$ .

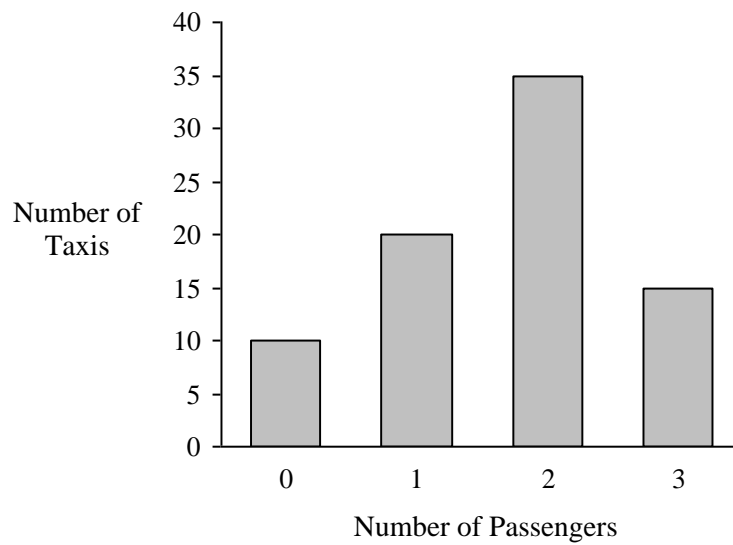
Ans: (a)  $r =$  \_\_\_\_\_ [1]

$s =$  \_\_\_\_\_ [1]

(b) \_\_\_\_\_ [1]

14 The following bar graph illustrates the results of a survey conducted to find the number of passengers in a random sample of taxis.

- (a) How many taxis are there in the sample?
- (b) What is the total number of passengers in all the taxis included in the survey?
- (c) Calculate the percentage of taxis which have more than one passenger.
- (d) Calculate the angle, in a pie chart, of the sector which represents taxis with no passenger.



- Answers: (a) \_\_\_\_\_ taxis [1]  
(b) \_\_\_\_\_ passengers [1]  
(c) \_\_\_\_\_ % [2]  
(d) \_\_\_\_\_ ° [2]

ANSWERS

1. 1.55 B1

2.a) 0.36 B1

b) 0.0573 B1

3a)  $x > -3$  M1  
 Ans = -2, -1 B1

b)  $y \leq 9$  M1  
 Ans = 9, 4, 1 B1

4a) 
$$\begin{array}{r} 5 \overline{) 540} \\ \underline{3} \phantom{0} \\ 3 \phantom{0} \\ \underline{3} \phantom{0} \\ 3 \phantom{0} \\ \underline{3} \phantom{0} \\ 2 \phantom{0} \\ \underline{2} \phantom{0} \\ 2 \phantom{0} \\ \underline{2} \phantom{0} \\ 1 \end{array}$$
 M1

Ans =  $5 \times 3^3 \times 2^2$  A1

b) 50 B1

5a) A:B  
 2:7  
 10:35  
 B: C  
 5:4  
 35:28 M1

Ans = 5:14 A1

b) 35 units  $\rightarrow$  140 M1  
 1 unit  $\rightarrow$  4  
 Ans = 292 A1

6a) 2300 / 3600 M1  
 Ans =  $115 / 8$  A1

b) 0.0235 B1

7a)  $16 + 4 + \frac{8}{3}$  M1  
 Ans =  $22\frac{2}{3}$  A1



b) 
$$\frac{28 + \frac{2}{3}}{-2}$$

$$= -14\frac{1}{3}$$
M1  
A1

8a)  $7x + 3y$  B1

b)  $2a - 10 + 21 - 14a$  M1  
 $= 11 - 12a$  A1

c) 
$$\frac{5x + 15 - 4x - 2}{10}$$

$$= \frac{x + 13}{10}$$
M1  
A1

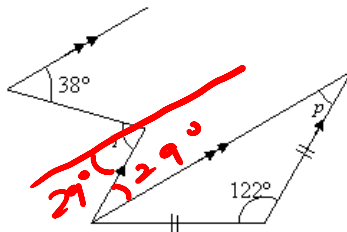
9a) 
$$\frac{250x}{5000}$$

$$= \frac{x}{20}$$
M1  
A1

b)  $135\left(\frac{x}{20}\right) = 810$  M1  
 $x = 120$  A1

10a)  $p = 29^\circ$  B1

b) M1



$q = 67^\circ$  B1

11a)  $75^\circ$  B1

b)  $(n-2)180 = 150n$  M1  
 $n = 12$  A1

12a) 
$$\frac{1}{2}(20 + 10)8$$

$$= 120$$
M1  
A1

b)  $120 \times 55 = 6\,600$  A1

c)  $120 + 120 + (60 \times 55)$  M1  
 $= 3540$  A1

13.a)  $r = 25$  B1  
 $s = 32$  B1

b)  $(n+1)^2$  B1

14a) 80 B1

b) 135 B1

c)  $\frac{50}{80} \times 100\%$  M1  
 $= 62.5$  A1

d)  $\frac{10}{80} \times 360$  M1  
 $= 45$  A1