

Name : _____

Teacher : _____



SYDNEY TECHNICAL HIGH SCHOOL

Celebrating 100 years of Public Education 1911 – 2011

2011 Trial School Certificate

Mathematics

Section 1

25 marks

Time allowed for this section is 30 minutes

Answer Questions 1 – 25 in the spaces provided

Each question is worth 1 mark

Calculators are NOT to be used in this section

Write using black or blue pen

There will be a short break between Section 1 and Section 2

Questions	Mark
1 - 9	
10 - 17	
18 - 25	

1. Evaluate $1\frac{2}{3} \times \frac{2}{5}$

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.....

2. What number is halfway between -4 and 12 .

.....

.....

3. Factorise $3a^2 + 11a - 20$

.....

.....

4. Evaluate $1.6 \div 0.04$

.....

.....

5. Koby has \$46 , Kevin has \$26 and Kelly has \$15. Koby wants them to share the money equally. How much will Koby have to give away so that all three men have the same amount of money ?

.....

.....

6. What is the cost of 40 litres of petrol at 147.9 cents per litre ?
(answer to the nearest dollar)

.....

.....

7. A sequence is formed by adding the two previous numbers together.
Fill in the two missing numbers in the sequence.

$$5, \square, \square, 27$$

8. Evaluate $x^2 - 4x + 8$ when $x = -4$.

.....

.....

9. A bag contains 2 blue marbles, 2 yellow marbles and 1 green marble.
Two marbles are drawn at random from the bag.
What is the probability that both the marbles are blue ?

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10. How many minutes in 0.6 hours ?

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11. Evaluate $\sqrt{6\frac{1}{4}}$

.....

.....

12. Find the surface area of a square pyramid with a base 24 cm in length and a perpendicular height of 16 cm.

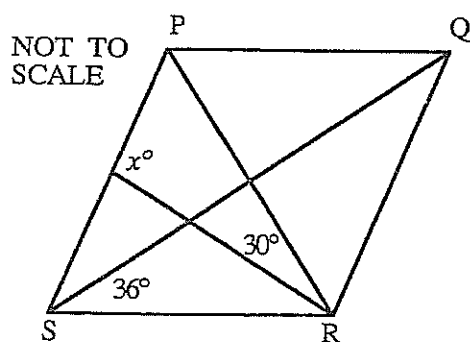
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13.



PQRS is a rhombus. Find the value of x .

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14. Write another score to make the range equal to the mode.

13 16 21 23 16 27 16

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.....

15. Insert grouping **symbols** to make the following statement true.

$$8 - 5 \times 3 - 4 + 1 = 4$$

16. Jesse buys a car valued at \$20 000. This car depreciates at the rate of 20% per annum. Find the value of the car in 2 years time.

.....

.....

.....

17. The stem-and-leaf plot shows the heights, in centimetres, of year 10 boys.

14	8
15	1 2 2 3 5 5 7 8 9 9
16	0 1 3 3 4 7 7 9
17	3 5 7 8 9
18	0 1

Find the median height.

.....

.....

18. Find 3 consecutive numbers with a product of 6840.

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19. For all numbers a, b the operation $a * b$ is defined by $a * b = ab - a + b$

Find x if $5 * x = 17$.

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20. Each sheet of paper in a stack of one million sheets is 0.25 mm thick.
Find the height of the stack in metres.

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21. Twenty people at a gathering all shake hands with each other exactly once.
How many handshakes take place ?

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22. A clock is set correctly at 1 pm. It loses 3 minutes every hour. What time will the clock read when the correct time is 10 am the next day ?

.....

.....

23. Write the next line of this pattern

$$1 \times 2 \times 3 \times 4 + 1 = 5^2$$

$$2 \times 3 \times 4 \times 5 + 1 = 11^2$$

$$3 \times 4 \times 5 \times 6 + 1 = 19^2$$

$$4 \times 5 \times 6 \times 7 + 1 = 29^2$$

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24. A circular sporting field has a rope stretching around the boundary.
How much longer will the rope need to be to increase the diameter
of the field by 20 metres ? (Give exact answer in metres)

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25. Two missiles are initially 5000 km apart. They travel along a straight line directly
towards each other., one travelling at 2000 km/hr and the other at 1000 km/hr.
How many kilometres are they apart 1 minute before impact ?

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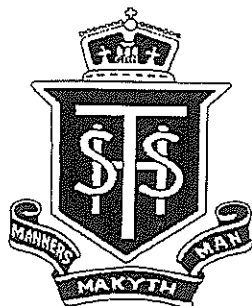
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SOLUTIONS

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Teacher : _____



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1 - 9	
10 - 17	
18 - 25	

1. Evaluate $1\frac{2}{3} \times \frac{2}{5}$

$$\frac{2}{3}$$

2. What number is halfway between -4 and 12 .

$$4$$

3. Factorise $3a^2 + 11a - 20$

$$(3a - 4)(a + 5)$$

4. Evaluate $1.6 \div 0.04$

$$40$$

5. Koby has \$46, Kevin has \$26 and Kelly has \$15. Koby wants them to share the money equally. How much will Koby have to give away so that all three men have the same amount of money?

$$\$17$$

6. What is the cost of 40 litres of petrol at 147.9 cents per litre ?
(answer to the nearest dollar)

\$ 59

7. A sequence is formed by adding the two previous numbers together.
Fill in the two missing numbers in the sequence.

5 , 11 , 16 , 27

8. Evaluate $x^2 - 4x + 8$ when $x = -4$.

40

9. A bag contains 2 blue marbles, 2 yellow marbles and 1 green marble.
Two marbles are drawn at random from the bag.
What is the probability that both the marbles are blue ?

$\frac{1}{10}$

10. How many minutes in 0.6 hours?

36

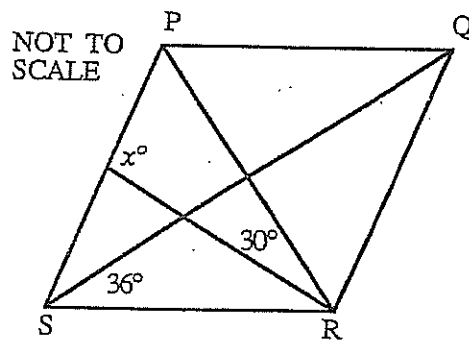
11. Evaluate $\sqrt{6\frac{1}{4}}$

$\frac{5}{2}$ or $2\frac{1}{2}$

12. Find the surface area of a square pyramid with a base 24 cm in length and a perpendicular height of 16 cm.

1536 cm²

- 13.



PQRS is a rhombus. Find the value of x .

96

14. Write another score to make the range equal to the mode.

13 16 21 23 16 27 16

either 11 or 29

15. Insert grouping symbols to make the following statement true.

$$(8 - 5) \times 3 - (4 + 1) = 4$$

16. Jesse buys a car valued at \$20 000. This car depreciates at the rate of 20% per annum. Find the value of the car in 2 years time.

\$ 12800

17. The stem-and-leaf plot shows the heights, in centimetres, of year 10 boys.

14	8
15	1 2 2 3 5 5 7 8 9 9
16	0 1 3 3 4 7 7 9
17	3 5 7 8 9
18	0 1

Find the median height.

162 cm

18. Find 3 consecutive numbers with a product of 6840.

$$18 \times 19 \times 20$$

19. For all numbers a, b the operation $a * b$ is defined by $a * b = ab - a + b$

Find x if $5 * x = 17$.

$$x = \frac{11}{3}$$

20. Each sheet of paper in a stack of one million sheets is 0.25 mm thick.
Find the height of the stack in metres.

$$250 \text{ m}$$

21. Twenty people at a gathering all shake hands with each other exactly once.
How many handshakes take place ?

$$190$$

22. A clock is set correctly at 1 pm. It loses 3 minutes every hour. What time will the clock read when the correct time is 10 am the next day ?

$$8:57 \text{ am}$$

23. Write the next line of this pattern

$$1 \times 2 \times 3 \times 4 + 1 = 5^2$$

$$2 \times 3 \times 4 \times 5 + 1 = 11^2$$

$$3 \times 4 \times 5 \times 6 + 1 = 19^2$$

$$4 \times 5 \times 6 \times 7 + 1 = 29^2$$

$$5 \times 6 \times 7 \times 8 + 1 = 41^2$$

24. A circular sporting field has a rope stretching around the boundary.
How much longer will the rope need to be to increase the diameter
of the field by 20 metres ? (Give exact answer in metres)

$$20\pi$$

25. Two missiles are initially 5000 km apart. They travel along a straight line directly
towards each other., one travelling at 2000 km/hr and the other at 1000 km/hr.
How many kilometres are they apart 1 minute before impact ?

$$50 \text{ km}$$

