SYDNEY BOYS HIGH SCHOOL

MOORE PARK, SURRY HILLS

Year 9

Yearly Examination 2007

Mathematics

General Instructions

- Working time – 90 minutes
- Write using black or blue pen.
- Approved calculators may be used.
- All necessary working MUST be shown in every question if full marks are to be awarded.
- Marks may not be awarded for untidy or badly arranged work.
- If more space is required, clearly write the number of the QUESTION on one of the back pages and answer it there. Indicate that you have done so.
- Clearly indicate your class by placing an X, next to your class

Examiner: *C. Kourtesis*

NAME:

Class	Teacher	
9 A	Mr Fuller	
9 B	Mr McQuillan	
9 C	Ms Evans	
9 D	Ms Ward	
9 E	Ms Nesbitt	
9 F	Mr Boros	

Section	Mark
A	**/17**
B	**/17**
C	**/18**
D	**/15**
E	**/16**
F	**/17**
Total	**/100**

SECTION A (18 marks) **ANSWERS** marks

1. Express 0.65 as a fraction in simplest form.

---

2. Find 8% of $2500.

---

3. Simplify i) $3a + 5b + 10a$

ii) $4 (2a + 3b)$

iii) $2^4 \times 2^{-2}$

---

4. Write 94.735 correct to one decimal place.

---

5. Divide $180 in the ratio 7:2 .

---

6. Factorise $3a + 6ab$.

---

7. Write in scientific notation

i) 7 035 469

ii) 0.00014

---

8. Calculate k if $\sqrt{2000} = k\sqrt{5}$.

SECTION A **ANSWERS** marks

9. Evaluate $\left(\frac{1}{9}\right)^{\frac{1}{2}}$

---

10. Simplify

i) $\frac{2a}{3} \times \frac{6}{a^2}$

ii) $\frac{x}{5} + \frac{2x}{9}$

---

11. If a = 4, b = -3 evaluate

i) ab^2

ii) (a - b)(a + b)

---

12. Solve

$5 + 3x = x - 13$

SECTION B **ANSWERS** marks

1. Expand and simplify the following:

   i) $(x + 5)(x - 10)$

   ii) $(4a - 1)(4a + 1)$

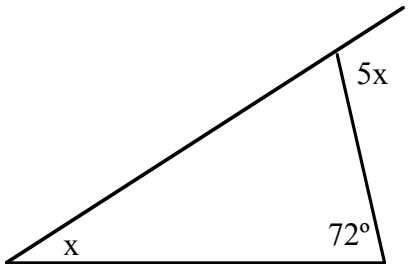
---

2. Find the size of each interior angle of a regular octagon.

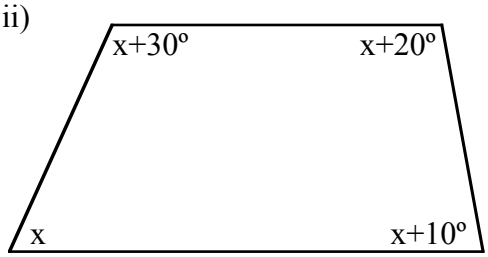
---

3. Find the value of x in the following:

   i)



   ii)



SECTION B **ANSWERS** marks

4. Name all quadrilaterals
whose diagonals are perpendicular.

---

5. Bob earns a salary of $87 500 p.a.
What is his fortnightly income?

---

6. The retail price of an LCD TV was $7000.
What was the original price
before the GSTof 10% was added?

---

7. Simplify $\frac{4a-12}{6}$.

---

8. Find the area of a square
with sides $(2x-3y)$ cm.

---

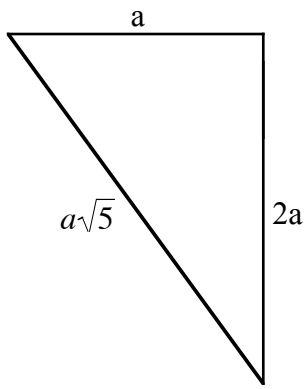
9. i) Solve the inequality $-4x > 16$.

ii) Graph the solution on a number line.

SECTION B **ANSWERS** marks

10. Is the triangle right-angled?

Give a reason for your answer.



---

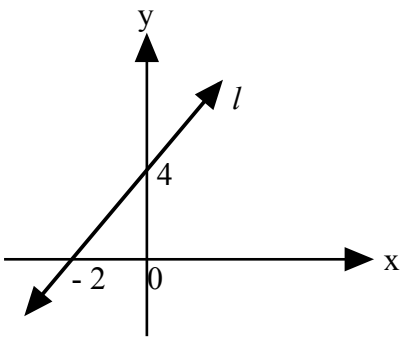
11. Write as algebraic expressions:

i) the length of a rectangle whose perimeter is 18 cm and width b cm.

ii) the square root of the sum of the squares of a and b .

SECTION C **ANSWERS** marks

1.



The equation of the straight line *l* is $y = mx + b$. Write down the values of m and b.

---

2. Express $L = k - mn$ with n as the subject.

---

3. Solve the equations:

i) $\frac{3}{2a} = 12$

ii) $\frac{n}{3} + \frac{2n+1}{4} = 1$

---

4. Factorise the following:

i) $x^2 - 25$

ii) $a^2 - 3a - 10$

iii) $x^3 + x^2 + 2x + 2$

SECTION C **ANSWERS** marks

5. Given the points A (4, - 8) and B (2, 4) find the:

i) length of the interval AB

ii) gradient of the line AB

iii) midpoint of the interval AB

---

6. Find the linear relationship between x and y from the table:

x	-2	-1	0	1
y	-5	-3	-1	1

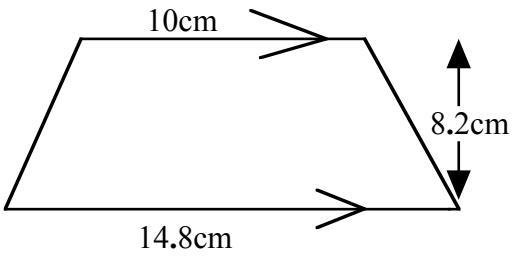
---

7. Express with a rational denominator

$$\frac{\sqrt{3}}{\sqrt{5}+2}$$

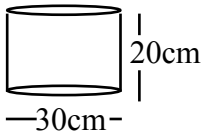
---

8. Find the area of the trapezium



SECTION D **ANSWERS** marks

1. For the cylinder



find the

i) volume in terms of π

ii) curved surface area
in terms of π

iii) capacity in litres
(correct to nearest litre)

---

2. Solve simultaneously using
the substitution method:

$5x - 3y = 10$

$x + y = 9$

---

3. Express $a = \dfrac{b+1}{3b-2}$
with b as the subject.

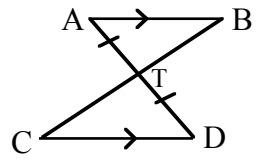
---

4. Simplify: $\dfrac{2-a}{a^2-4}$

SECTION D **ANSWERS** marks

5. At a supermarket brand A of a bottle of sauce contains 750ml and costs $1.14, while brand B contains 600ml and costs 90c.
   Which is the better buy? Explain.

6.



The straight lines AD and BC intersect at T. Explain why AB = CD.

---

7. An irrigation channel is 2m wide and 0.5m deep.
   Water flows along it at 2km/h.
   How many kilolitres are delivered in 8 hours?

SECTION E **ANSWERS** marks

1. Factorise

$3m^2 - 11m + 6$

---

2. Find $\sqrt{a^9 b^{16}}$

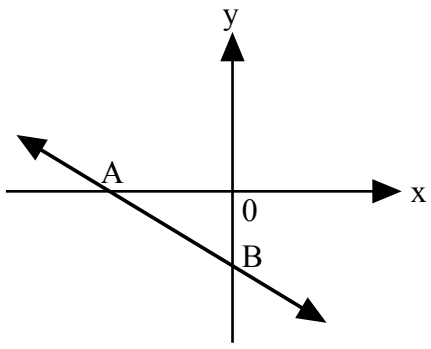
---

3. Solve the inequality

$$\frac{3a}{4} - \frac{1-a}{3} \leq 2$$

---

4. The diagram below shows the graph of the straight line $3x + 4y + 7 = 0$.



Find the area of triangle A0B.

---

5. The probability of drawing two hearts from a standard pack of cards is $\frac{3}{51}$.

What is the probability that two cards drawn are not both hearts?

SECTION E **ANSWERS** marks

6. Find the equation of the line passing through the points A (-1,4) and B (6,10).

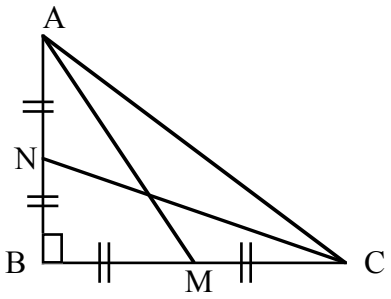
---

7. A boy cycles from his house at a constant speed of 20km/h, to his friend's house *d* km away. He then cycles back to his house at a constant speed of 25km/h.

i) Show that the expression for time T, taken for the whole trip, is given by $T = \frac{9d}{100}$.

ii) If the whole trip takes 54 minutes, how far is it to his friend's house?

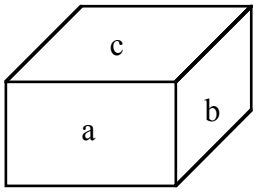
8.



In the above diagram AN=BN=BM=MC .
If AM=CN=$\sqrt{5}$ cm , find the length of AC.

SECTION F **ANSWERS** marks

1.



The rectangular prism has adjacent faces of area a, b and c units^2. Find an expression for the volume of the prism in terms of a, b and c.

---

2. Sketch the region that is common to the inequalities
$y \geq 0$, $x \leq 5$ and $x - 2y - 4 \geq 0$.

SECTION F **ANSWERS** marks

3. The straight line $ax + by + 10 = 0$
passes through the point (5, -2)
and is also perpendicular to the straight line $3x - 4y = 12$.
Find the values of a and b.

---

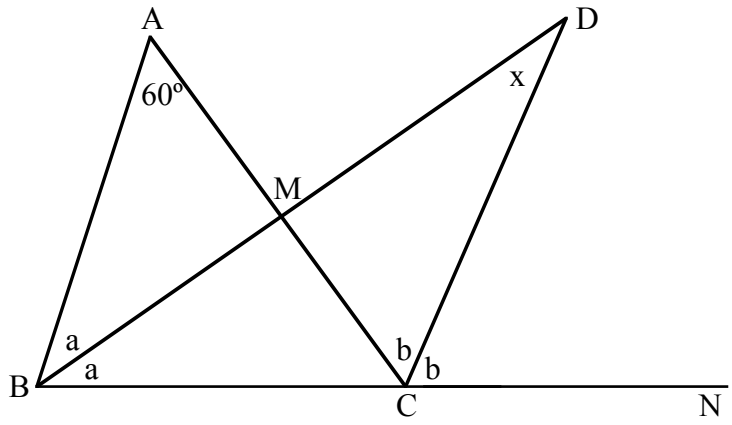
4. Factorise $xy(m^2 + n^2) + mn(x^2 + y^2)$.

---

5. Simplify $\dfrac{1}{1+\sqrt{1+a}} + \dfrac{1}{1-\sqrt{1-a}}$

SECTION F **ANSWERS** marks

6.



From the diagram above find the value of:

i) b - a (giving reasons)

ii) x (giving reasons)

THIS IS THE END OF THE EXAM