LAI KING CATHOLIC SECONDARY SCHOOL
Second Term Standard Test   2018 – 2019
S.1   Mathematics
Time Allowed : 45 minutes

Date: 17-4-2019   Name : _____

Total Marks: 50   Class/ Group : A/ B/ C/ D/ R

                                   Class No. : _____

Instructions:

1. **This paper must be answered in English.**

2. **This paper consists of TWO sections, A and B.**
    Section A carries 20 marks and section B carries 30 marks.

3. **Attempt all questions. <u>Write ALL your answers in the spaces</u>**
    <u>provided in the Question-Answer Book.</u>

4. **Unless otherwise specified, all working in section B must be**
    clearly shown.

Section A: Multiple Choice Questions   (20 marks)

Question 1.

If the area of $\triangle BCD$ in the figure is 8 cm², find the area of $\triangle ABD$.
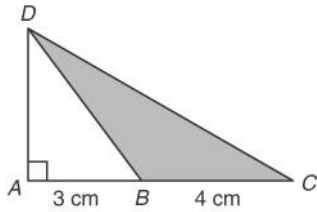
A.   6 cm²
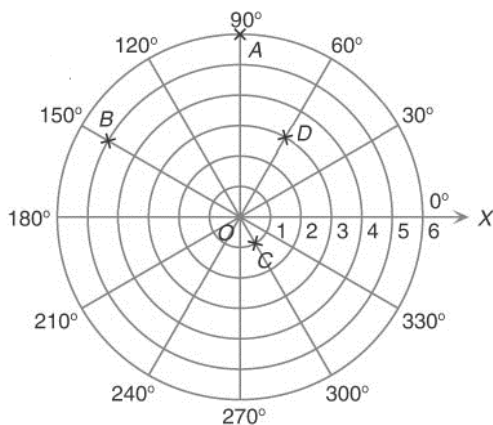
B.   14 cm²

C.   16 cm²

D.   20 cm²

Question 2.

Given five points $A(-3, 4)$, $B(4, 4)$, $C(4, 6)$, $D(4, -2)$ and $E(-3, -2)$, which of the following two lines are parallel to the x-axis?

A. AB and AC

B. AB and DE

C. AE and DE

D. BC and BD

Question 3.

The figure shows 4 points A, B, C and D on a polar coordinate plane.

Which of the following angles is the largest?

A. $\angle AOB$

B. $\angle AOD$

C. $\angle BOC$

D. $\angle COD$

Question 4.

It is given that the distance between $P(-5, -2)$ and Q is 3 units. Which of the following CANNOT be the coordinates of Q?

A. $(-2, -2)$
B. $(-5, 0)$
C. $(-5, -5)$
D. $(-8, -2)$

Question 5.

Simplify $-27y^{12} \div (-3y^4)$.

A. $9y^3$
B. $9y^8$
C. $-9y^3$
D. $-9y^8$

Question 6.

The number of terms of the polynomial $x^4 + 2x^2 + 5x + 3$ is

A.   1.
B.   2.
C.   3.
D.   4.

Question 7.

Find the value of the polynomial $5x^2 - x + 2$ when $x = -1$.

A. -2
B.   5
C.   6
D.   8

Question 8.

The following table shows the distribution of pulse rates of a group of youngsters after doing 20 sit-ups.
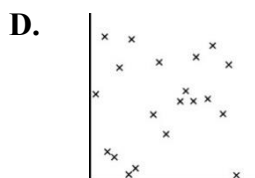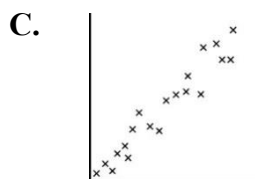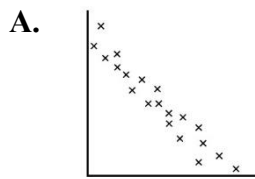
Pulse rate (beats per minute)	70 – 79	80 – 89	90 – 99	100 – 109	110 – 119
Number of youngsters	6	15	12	9	8

Find the percentage of youngsters whose pulse rate is more than 99 beats per minute after doing 20 sit-ups.

A.   6%
B.   12%
C.   34%
D.   38%

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Question 9.

Which of the scatter diagrams below may show a negative relationship?

A.

B.

C.

D.

Question 10.

The figure below shows a rectangular tank filled with water. After putting eight cubes, each of side 3 cm, into the tank, the tank becomes fully-filled with water and no water overflows. If all the cubes are totally submerged, find the value of x.
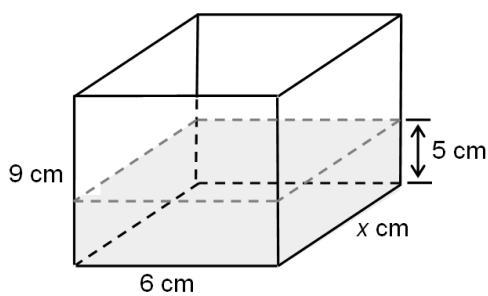
A.   6

B.   7

C.   8

D.   9

<div align="center">

END OF SECTION A

</div>

LAI KING CATHOLIC SECONDARY SCHOOL

Second Term Standard Test   2018 – 2019

S.1   Mathematics

Question-Answer Book

Name ：_____

Class/ Group : A/ B/ C/ D/ R

Class Number：_____

Section A:		*Total:*
Section B:		

Section A: Multiple Choice Questions   (20 marks)

Choose the correct answer and put a '✔' in the space provided.

	1	2	3	4	5	6	7	8	9	10
A										
B										
C										
D										

Section B: Long Questions   (30 marks)

Question-11.

Complete the following table.

(3 marks)

Polynomial	Constant term	Coefficient of x	Degree
$5 - 8x$			

Question-12.

The pie chart below shows the grades obtained by the S1 students in a Chinese examination.

Grades obtained by S1 students in a Chinese examination

(a) Which grade did most of the students obtain in the examination?

(b) A student can get a pass in the examination only if he obtains grade 'C' or above. What percentage of students passed the examination?

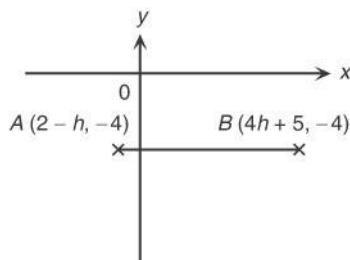**(c)** If 20 students obtained grade 'E' in the examination, how many students obtained grade 'C' or above? (3 marks)
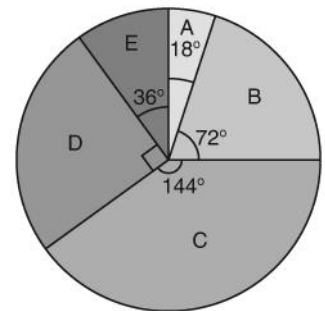
Question-13.

The figure shows two points $A(2 - h, -4)$ and $B(4h + 5, -4)$. If $AB = 18$ units, find the value of h.

(2 marks)

Question-14.
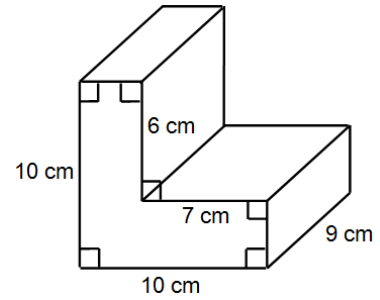The figure shows a prism.

(a) Find the volume of the prism.

(b) Find the total surface area of the prism.

(3 marks)

10 cm

6 cm

7 cm

9 cm

10 cm

Question-15.
(a) If a point A (−4 , 4) is translated 8 units to the left to a point B, find the coordinates of B.
(b) If a point C(6 , 5) is reflected in the y-axis to a point D, find the coordinates of D.
(c) If a point E(3 , 6) is rotated clockwise about the origin O through 90° to a point F, find the coordinates of F.

(3 marks)

Question 16.

The following stem-and-leaf diagram shows the ages of 20 staff in a company.

Ages of 20 staff in a company

Stem (10)	Leaf (1)
1	8 8 9 a
2	b 0 5 6 8
3	3 4
c	
5	0 1 5 5 7
6	3 d 3 4

(a) Find the values of a and b.

(b) A questionnaire will be sent to the staff aged between 20 and 60 inclusively. How many staff will receive the questionnaire?

(c) If 35% of the staff reaches the retiring age, find the retiring age.   (4 marks)
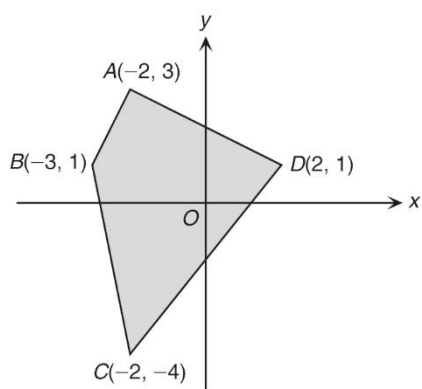
Question-17.

Simplify $(x^2 + x^3 - 5) + (1 + 2x^2 - 3x) - (3x^3 - 5)$, and arrange the terms in descending powers of x.

(3 marks)

Question 18.

Find the area of the following figure.   (4 marks)

Question-19.

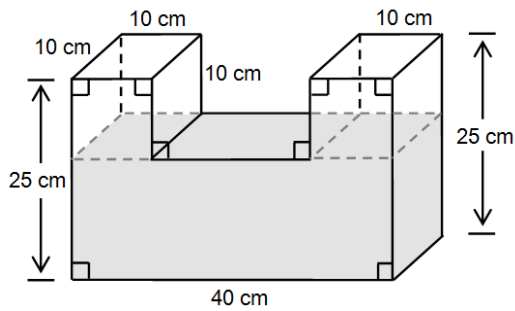Figure 1 shows a container in the shape of a prism. It contains some water.
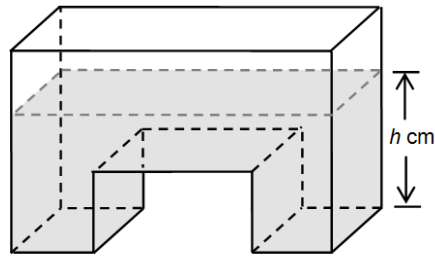
Figure 1   Figure 2

(a) Refer to figure 1.

    (i) Find the volume of water in the container.

    (ii) Find the total area of the wetted surface of the container.

(b) The container is then turned upside down as shown in figure 2.

    (i) Find the value of h.

    (ii) John claims that the total area of the wetted surface of the container is increased. Do you agree? Explain your answer.   (5 marks)

END OF PAPER

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Second Term Standard Test   2018 – 2019
S.1   Mathematics
Question-Answer Book

Name ：_____

Class/ Group : A/ B/ C/ D/ R

Class Number：_____

		Total:
Section A:		
Section B:		

SUGGESTED   SOLUTION

Section A: Multiple Choice Questions   (20 marks)

Choose the correct answer and put a '✓'in the space provided.

	1	2	3	4	5	6	7	8	9	10
A	✓								✓	
B		✓		✓	✓					
C			✓					✓		
D						✓	✓			✓

Section B: Long Questions   (30 marks)   (MAX pp–1 , MAX u–1)

Question-11.

Polynomial	Constant term	Coefficient of x	Degree
$5 - 8x$	<u>5</u>	<u>-8</u>	<u>1</u>

                    1A   1A   1A

Question-12.
(a) Most of the students obtained grade 'C' in the examination.   1A

(b) The sum of the angles at the centre of the sectors of grades 'A', 'B' and 'C'
    $= 18° + 72° + 144°$
    $= 234°$

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Percentage of students passed the examination $= \dfrac{234°}{360°} \times 100\%$

$\qquad\qquad\qquad\qquad\qquad = \underline{\underline{65\%}}$ 1A

(c) Number of students obtained grade 'C' or above $= 20 \times \dfrac{234°}{36°}$

$\qquad\qquad\qquad\qquad\qquad = \underline{\underline{130}}$ 1A

Question 13.

$\because \quad AB = 18 \text{ units}$

$\therefore \quad 4h + 5 - (2 - h) = 18$ 1M

$\qquad 4h + 5 - 2 + h = 18$

$\qquad\qquad\qquad 5h = 15$

$\qquad\qquad\qquad h = \underline{\underline{3}}$ 1A

Question 14.

(a) Base area $= (10 \times 10 - 6 \times 7)\,\text{cm}^2$

$\qquad\qquad = 58\,\text{cm}^2$

Volume of the prism $= 58 \times 9\,\text{cm}^3$

$\qquad\qquad\qquad = \underline{\underline{522\,\text{cm}^3}}$ 1A

(b) Total surface area of the prism $= [(10 \times 9) \times 4 + 58 \times 2]\,\text{cm}^2$ 1M

$\qquad\qquad\qquad\qquad\qquad = \underline{\underline{476\,\text{cm}^2}}$ 1A

Question-15.

(a) (-12,4) 1A

(b) (-6, 5) 1A

(c) (6, -3) 1A

Question-16.

(a) $a = 9$, $b = 0$ 1A + 1A

(b) Number of staff who will receive the questionnaire

$\qquad = 5 + 2 + 5$

$\qquad = \underline{\underline{12}}$ 1A

(c) Since $20 \times 35\% = 7$, 7 staff reaches the retiring age.

$\qquad \therefore$ From the stem-and-leaf diagram, the retiring age is 55. 1A

S1 Mathematics

Question 17.

$$(x^2+x^3-5)+(1+2x^2-3x)-(3x^3-5)=x^2+x^3-5+1+2x^2-3x-3x^3+5 \qquad \text{1M}$$
$$=x^3-3x^3+x^2+2x^2-3x-5+1+5$$
$$=\underline{\underline{-2x^3+3x^2-3x+1}} \qquad \text{1A + 1A for descending}$$

Question-18.
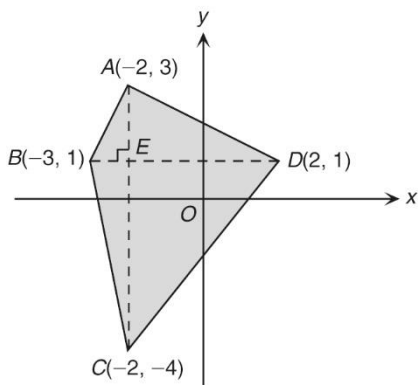
Take AC as the common base of $\triangle ABC$ and $\triangle ADC$.

Draw BE and DE such that $BE \perp AC$ and $DE \perp AC$.

Then, the coordinates of $E = (-2, 1)$.

$AC = [3-(-4)]$ units

  $= 7$ units

$BE = [-2-(-3)]$ units   either one 1M

  $= 1$ unit

$DE = [2-(-2)]$ units

  $= 4$ units

Area of $\triangle ABC = \dfrac{1}{2} \times AC \times BE$

      $= \dfrac{1}{2} \times 7 \times 1$ sq. units

      $= 3.5$ sq. units   1A

Area of $\triangle ADC = \dfrac{1}{2} \times AC \times DE$

      $= \dfrac{1}{2} \times 7 \times 4$ sq. units

      $= 14$ sq. units   1A

$\therefore$ Area of quadrilateral $ABCD$

  $=$ area of $\triangle ABC +$ area of $\triangle ADC$

  $= (3.5+14)$ sq. units   1A

  $= \underline{\underline{17.5 \text{ sq. units}}}$

Question-19.

(a) (i) Volume of water $= 40 \times 10 \times (25-10) \text{ cm}^3$

$$= \underline{\underline{6000 \text{ cm}^3}}$$ 1A

(ii) Total area of the wetted surface of the container

$= [40 \times 10 + (40+10) \times 2 \times (25-10) + (40-10-10) \times 10] \text{ cm}^2$

$= (400+1500+200) \text{ cm}^2$

$= \underline{\underline{2100 \text{ cm}^2}}$ 1A

(b) (i) $\because$ Volume of the water $= 6000 \text{ cm}^3$

$\therefore$ $[h \times 40 - (40-10-10) \times 10] \times 10 = 6000$

$$40h - 200 = 600$$

$$40h = 800$$

$$h = \underline{\underline{20}}$$ 1A

(ii) Total area of the wetted surface of the container after turning upside down

$= [(20 \times 40 - 10 \times 20) \times 2 + 20 \times 10 \times 2 + 10 \times 10 \times 4 + 10 \times 20] \text{ cm}^2$

$= (1200 + 400 + 400 + 200) \text{ cm}^2$ 1A

$= 2200 \text{ cm}^2$

$\therefore$ The total area of the wetted surface of the container after turning

upside down is greater than before.

$\therefore$ The claim is agreed.   1 f.t.

End of Marking Scheme

S1 Mathematics