This is a Class 1 exam

Lebanon Evangelical School
for Boys and Girls
Loueizeh - Baabda

Stage Exam 05

Monday 09MAY2022

Do NOT write in this box. Your MARK will be placed here.

Subject :	Maths
Class :	7A and 7E
Teacher :	Ms. Lydia Goodwin
Duration :	1 hour

Calculators are NOT allowed. Draw using a compass, ruler, and protractor as demonstrated in class. Drawings may be done in pencil. All other work must be in pen. Show all of your work. Do not erase construction lines.

Your name :		*Time taken to complete exam*
Your Class :		
Exam Room :		
How many sheets, including cover sheet :		

- Do not open this paper until the teacher in charge instructs you to do so.
- The most important thing to remember in taking an exam is NEVER PANIC.
- If you are caught cheating in this exam, you will be awarded zero for ALL exams that are taken on this day.

A. Complete the following fraction operations. Write your answer in lowest terms. [7 marks]

1. $\frac{2}{5} \div \frac{2}{3}$

2. $\frac{1}{6} \times 5$

3. $\frac{15}{16} - \frac{11}{24}$

B. Simplify $3x^2 + 4y^2 - 5x^2 + y^2 + x^2 - 5 - 2y$. [2 marks]

C. Given the algebraic expressions [4 marks]

$A = 2x^4 - 3x^2 + x + 3$ and $B = 3x^4 + 2x^3 - x + 5$

calculate the following:

1. P = A + B

2. M = B - A

D. Order the following fractions from least to greatest: $\frac{3}{100}, \frac{21}{500}, \frac{2}{43}$ [3 marks]

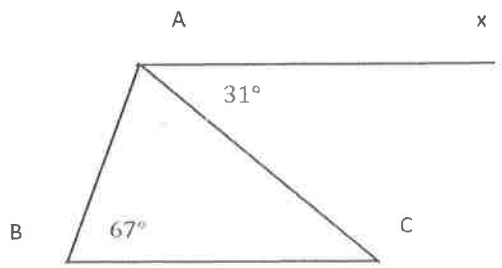
[1 mark]

E. Complete the following proof by writing the justification for 3 on your answer sheet.

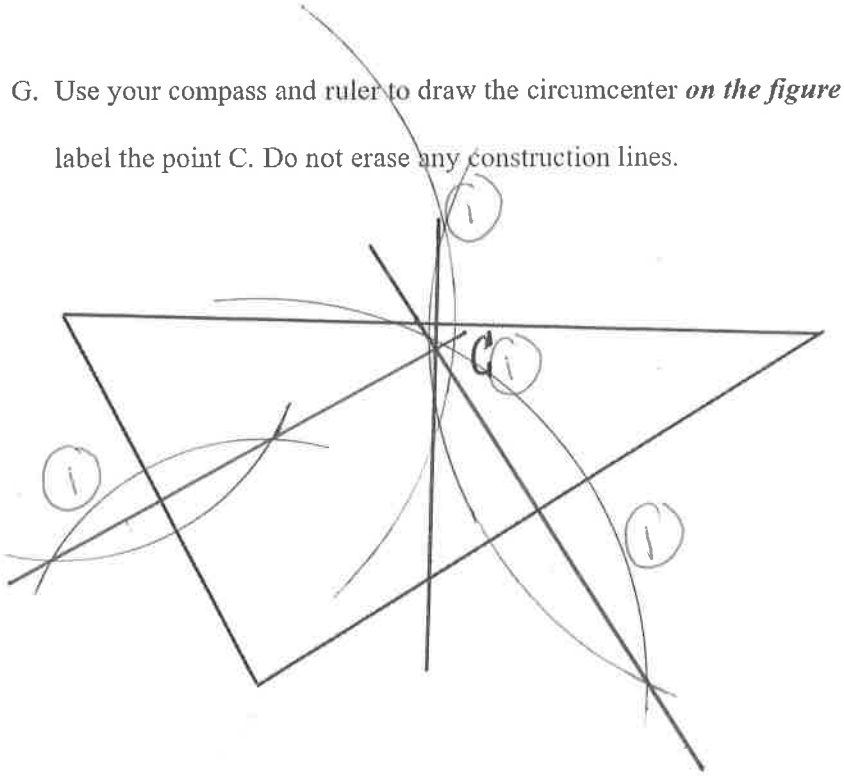
Proof: $(d_1) // (d_3)$

Statements	Justifications
1. $(d_1) // (d_2)$	1. Given
2. $(d_3) // (d_2)$	2. Given
3. Q.E.D. $(d_1) // (d_3)$	3.

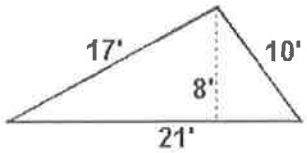
F. (Ax) // (BC). Prove $\widehat{BAC} = 82°$. [8 marks]



G. Use your compass and ruler to draw the circumcenter ***on the figure below*** and label the point C. Do not erase any construction lines. [4 marks]



H. Find the area and perimeter of the triangle below. [4 marks]



I. Let ABC be a triangle such that BC = 7 cm, $\widehat{ABC} = 50°$ and $\widehat{ACB} = 60°$. The bisectors of $\widehat{BAC}$ and $\widehat{ACB}$ meet at I.

1. Use your compass, ruler, and protractor to draw the triangle, the angle bisectors, and label I. Do not erase any construction lines. [4 marks]

2. What is the special name for point I? (Name the type of triangle center.) [1 mark]

3. BONUS (total marks not to exceed 100%): Prove $\widehat{IAC} = 35°$. [5 marks]

A.

1. $\frac{2}{5} \div \frac{2}{3}$

$= \frac{2}{5} \times \frac{3}{2}$ (1)

$= \frac{6}{10}$

$= \frac{3}{5}$ (1)

2. $\frac{1}{6} \times 5$

$= \frac{1}{6} \times \frac{5}{1}$ (1)

$= \frac{5}{6}$ (1)

3. $\frac{15}{16} - \frac{11}{24}$

$= \frac{45}{48} - \frac{22}{48}$ (1)

$= \frac{(45-22)}{48}$

$= \frac{23}{28}$ (1)

L.C.M.$(16, 24) = 2^4 \times 3 = 48$ (1)

16	2	24	2
8	2	12	2
4	2	6	2
2	2	3	3
1		1	

$16 = 2^4$ $\quad 24 = 2^3 \times 3$

$\frac{15}{16} \overset{\times 3}{=} \frac{45}{48}$

$\frac{11}{24} \overset{\times 2}{=} \frac{22}{48}$

B.

$3x^2 + 4y^2 - 5x^2 + y^2 + x^2 - 5 - 2y$

$= (3x^2) + [4y^2] + (-5x^2) + [y^2] + (x^2) + -5 + -2y$

$= 3x^2 + -5x^2 + x^2 + 4y^2 + y^2 + -5 + -2y$ (1)

$= -x^2 + 5y^2 + -2y + -5$ (1)

C.

1. $P = A + B$

$= (2x^4 + 3x^2 + x + 3) + (3x^4 + 2x^3 + x + 5)$ (1)

$= 5x^4 - x^2 + 8$ (1)

2. $M = B - A$

$= (3x^4 + 2x^3 - x + 5) - (2x^4 - 3x^2 + x + 3)$

$= 3x^4 + 2x^3 + -x + 5 + -2x^4 + 3x^2 + -x + -3$ (1)

$= 3x^4 + -2x^4 + 2x^3 + 3x^2 + -x + -x + 5 + -3$

$= x^4 + 2x^3 + 3x^2 + -2x + 2$ (1)

D. $\frac{3}{100}, \frac{21}{500}, \frac{2}{43}$

L.C.M.$(3, 21, 2) = 3 \times 7 \times 2 = 42$ (1/2)

21	3
7	7
1	

$21 = 3 \times 7$

$3 = 3$

$2 = 2$

$\frac{3}{100} \times \frac{14}{14} = \frac{42}{1400}$ (1/2)

$\frac{21}{500} \times \frac{2}{2} = \frac{42}{1000}$ (1/2)

$\frac{2}{43} \times \frac{21}{21} = \frac{42}{901}$ (1/2)

$\frac{42}{1400} < \frac{42}{1000} < \frac{42}{901}$ (½)

$\frac{3}{100} < \frac{21}{500} < \frac{2}{43}$ (½)

E.

3. If two lines are parallel to the same line, then they are parallel to each other. (1)

E. Proof: $B\hat{A}C = 82°$ (1)

Statements	Justifications
(1) $(Ax) \parallel (BC)$ (1)	(1) Given (1)
(2) $A\hat{C}B = x\hat{A}C$ (1)	(2) ~~Co~~ Alternate Interior Angles Theorem (1)
(3) $x\hat{A}C = 31°$	(3) Given
(4) $A\hat{C}B = 31°$	(4) Substitution
(5) $A\hat{B}C + B\hat{C}A + C\hat{A}B = 180°$ (1)	(5) Sum of interior angles in a triangle is 180° (1)
(6) $A\hat{B}C = 67°$	(6) Given
(7) $67° + B\hat{A}C + 31° = 180°$	(7) Substitution
(8) Q.E.D. $B\hat{A}C = 82°$ (1)	(8) Solved

OR

To Be Proven: $B\hat{A}C = 82°$ (1)

Given $(Ax) \parallel (BC)$ and $x\hat{A}C = 31°$ (2)

then $x\hat{A}C = A\hat{C}B = 31°$ (alternate interior angles) (2)

But $A\hat{B}C + C\hat{A}B + B\hat{C}A = 180$ (sum of interior angles in a triangle) (2)

and $A\hat{B}C = 67°$ (given).
Then, $67° + 31° + B\hat{A}C = 180°$ (substitution).
Therefore $B\hat{A}C = 82°$ (solved) (1)

G. See the question paper.

H. $A = \frac{b \times h}{2}$ (1)

$= \frac{21\,ft \times 8\,ft}{2}$

$= \frac{168\,ft^2}{2}$

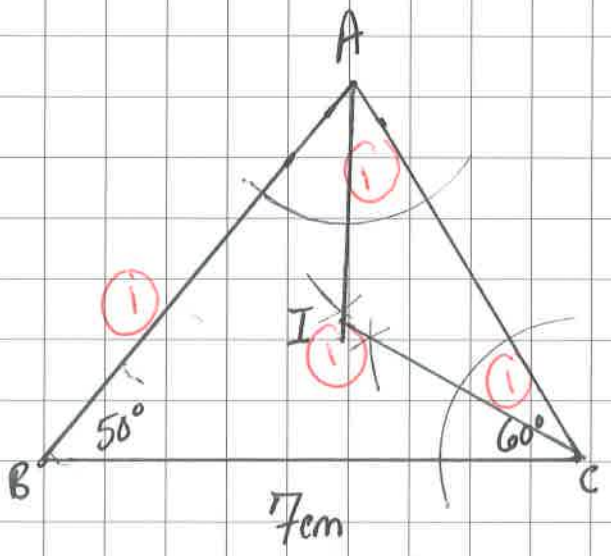
$= 84\,ft^2$ (1)

$P = 10\,ft + 21\,ft + 17\,ft$ (1)

$= 48\,ft$ (1)

I.

1.



(1) (1) (1) (1)

2. I is called the incenter. (1)

3. Proof: $I\hat{A}C = 35°$ (1)

Statements	Justifications
① $B\hat{A}C + A\hat{C}B + C\hat{B}A = 180°$ (½)	① Sum of the interior angles in a triangle is 180° (½)
~~$B\hat{A}C +$~~	
② $A\hat{C}B = 60°$; $C\hat{B}A = 50°$ (½)	② Given (½)
③ $B\hat{A}C + 60° + 50° = 180°$	③ Substitution
④ $B\hat{A}C = 70°$	④ Solved for $B\hat{A}C$
⑤ $I\hat{A}C = \frac{1}{2} B\hat{A}C$ (1½)	⑤ Definition of an angle bisector (1½)
⑥ $I\hat{A}C = \frac{1}{2}(70°)$	⑥ Substitution
⑦ Q.E.D. $I\hat{A}C = 35°$ (1)	⑦ Solved for $I\hat{A}C$