1. Suppose that $n^{\Delta} = \left(2 \times n\right) + n^2$, where n is a positive integer and $x = \left(10^{\Delta}\right)^{\Delta}$.
   Find the sum of all digits of x. **(2.5 Marks)**

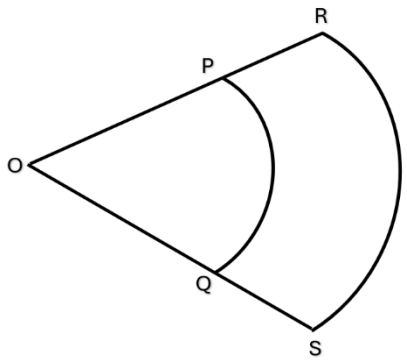
2. If the Least Common Multiple (LCM) of 28 and m is equal to the Greatest Common Divisor (GCD) of 168 and 420, what is the number of the possible values for m? **(2.5 Marks)**

3. Determine the remainder when $(2563^3 \cdot 2566^4 \cdot 2569^5)$ is divided by 5. **(2.5 Marks)**

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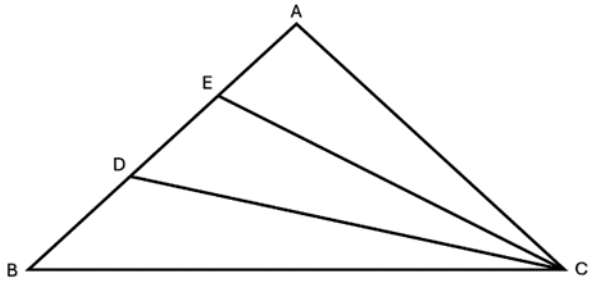
4. A two-digit number is four times the sum of its digits. If 27 is added to this number, the result is a two-digit number with the digits interchanged. What is the sum of the digits of this number? **(2.5 Marks)**

5. From the figure below, PQ and RS are the arcs lengths of two circles with the center point at O, and the radii are 12 cm and 20 cm, respectively.
If $R\hat{O}S = 72^\circ$, determine the sum of the arc lengths PQ and RS.
(Given that $\pi = 3.14$) **(2.5 Marks)**



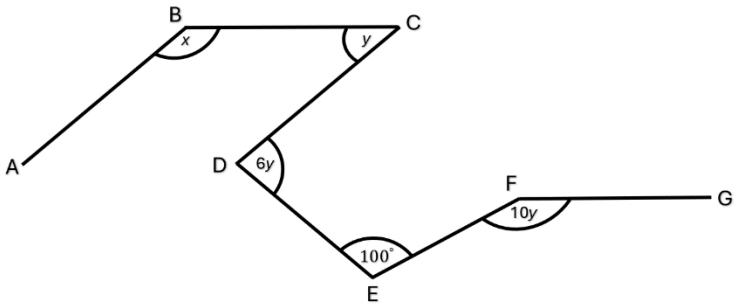
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6. Given a triangle ABC with $AB = AC$ and $B\hat{A}C = 81^\circ$ as shown in the figure.



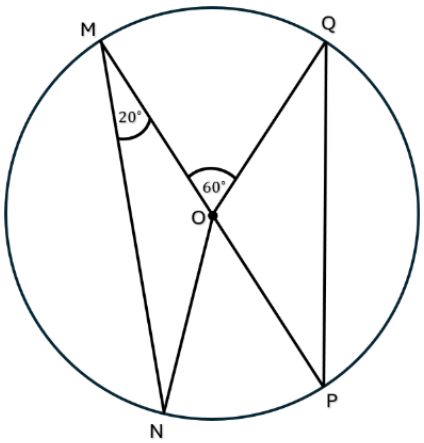
If lines $\overline{CE}$ and $\overline{CD}$ divide angle $A\hat{C}B$ into three equal angles, what is the measure of angle $C\hat{E}B$ in degrees? **(2.5 Marks)**

7. Let $\overline{AB} \parallel \overline{CD}$ and $\overline{BC} \parallel \overline{FG}$ as shown in the figure. Find the difference between x and y. **(2.5 Marks)**



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8. Let O be the center of the circle and $\overline{MP}$ is the diameter of the circle as shown in the figure. What is the value of $N\hat{O}P + O\hat{P}Q$? **(2.5 Marks)**



9. From the pattern of the numbers: $5, 88, 17, 73, 29, 58, 41, 43, \ldots$.
Find the difference between 11^{th} and 14^{th} terms. **(4.5 Marks)**

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10. If $\frac{25^{3x+2}\times 125^{2-x}\times 5^{-3}}{5^{3x+6}} = 5^{a}$, what is the value of $2a^4+3$? **(4.5 Marks)**

11. Find the value of x that satisfies the equation **(4.5 Marks)**

$$\frac{\frac{x}{333}}{\left(1-\frac{1}{333}\right)}+\frac{\frac{x}{334}}{\left(1-\frac{1}{333}\right)\left(1-\frac{1}{334}\right)}+\frac{\frac{x}{335}}{\left(1-\frac{1}{333}\right)\left(1-\frac{1}{334}\right)\left(1-\frac{1}{335}\right)}+\ldots+$$

$$\frac{\frac{x}{415}}{\left(1-\frac{1}{333}\right)\left(1-\frac{1}{334}\right)\left(1-\frac{1}{335}\right)\ldots\left(1-\frac{1}{415}\right)}=\frac{3}{4}$$

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12. A battery factory produces A batteries per day. The number A is split equally into 4 parts and sold to four stores. Store B is one of the stores that buys batteries from the factory at 16 baht per battery and sets a profit of 31.25%. A day after closing the store, the batteries are not sold out; 10 batteries are left, resulting in income equal to the cost price. How many batteries does the factory produce per day? **(4.5 Marks)**

13. A clock in Thailand shows the time as $3:40$ p.m.. If the time in Thailand is 2 hours behind Japan but 6 hours and 30 minutes ahead of England, find the sum of the smaller angles between the hour and minute hands of the clocks in all three countries at present. **(4.5 Marks)**

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14. Figure 1 shows the cutting of a square prism with a side of 5 meters and a height of 12 meters in a horizontal plane 3 times. Let A, B and C denote $\frac{1}{8}, \frac{1}{4}$ and $\frac{1}{3}$ of the total height, respectively. When all of them are arranged as shown in Figure 2, find the total surface area of Figure 2.

(4.5 Marks)

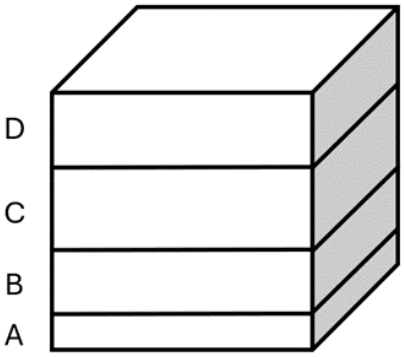


Figure 1

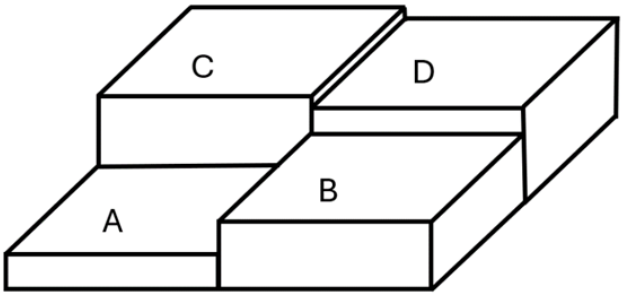


Figure 2

15. Boy trained for a marathon in 5 days and recorded the distances each day: $12, 14, 30, 31,$ and 40 kilometers, respectively. It was found that Boy recorded the final distance incorrectly. If the average correct distance is 25 kilometers, what is the actual distance?

(4.5 Marks)

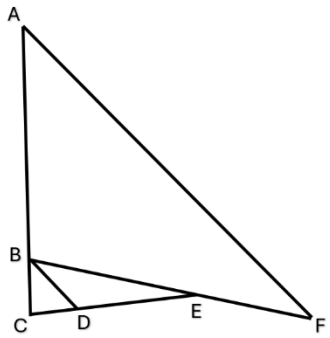
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16. Yada reads a book. On the first day, she reads 20% of the total number of pages. On the second day, she reads 64 pages more than on the first day. On the third day, she reads 50% of the remaining pages. If Yada reads 263 pages in three days, what is the total number of pages of this book? **(6 Marks)**

17. The price of an air conditioner is $38,250$ baht. There is a higher demand in summer, resulting in the price of the air conditioner being adjusted up from the original price by 10% and there is a promotion "Pay in cash, get a discount of another 8%". Therefore, Mr. Moji wants to buy the air conditioner by paying in cash and using a store discount coupon for another 420 baht. After reducing the total price, Mr. Moji must pay a net amount of A baht. What is the value of $\frac{A}{100}$? **(6 Marks)**

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18. From the figure below, E is the midpoint of side BF, $AC = 5BC$ and $CE = 3CD$. If the quadrilateral $ACEF$ has an area of 675 square centimeters, find the area of triangle BED. **(6 Marks)**



19. Given that a triangular prism-shaped tube has a base length of 5 millimeters and a height of 8 millimeters. Water flows through this tube at a speed of 1584 meters per minute. Then, the water flows into a conical container that has a base diameter of 30 cm and a height of 20 cm. How many seconds will it take for the conical container to become full? (Given that $\pi = 3.14$) **(6 Marks)**

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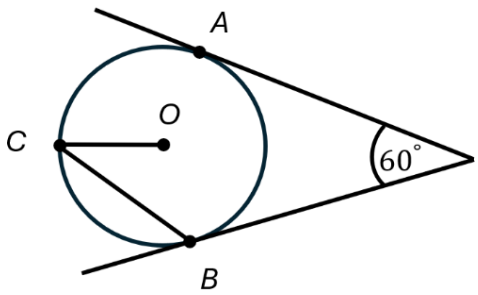
20. At a birthday party of Nina's friend, there is a shooting game. The rules of the game are: Each round costs 1 dollar. If you hit the target, you win 2 dollars. Each person can play no more than 5 rounds. Nina is interested in playing the game, but she has only 1 dollar. She will stop playing once she has made a profit of 2 dollars or has lost everything. How many ways does Nina play the game? **(6 Marks)**

21. Let A be a two-digit number whose sum of all its digits is 8. If the digits of A are interchanged to obtain a new two-digit number B, whose difference between the two digits is 2, and B is greater than A, find the value of $A^2 \div 175 \times B$. **(2.5 Marks)**

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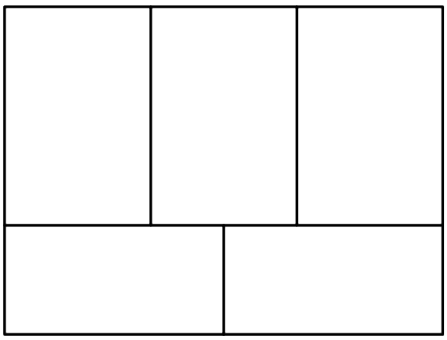
22. Four even positive integers are consecutive. The difference between the square of the largest number and the square of the smallest number is equal to the difference between the products of the remaining numbers and 84. Find the product of all digits these four numbers. **(4.5 Marks)**

23. From the diagram below, define the arc length ratio $AC:BC=13:11$. Find the measure of $B\hat{C}O$. (Hint: The radius is perpendicular to the tangent line at the point of tangency.) **(2.5 Marks)**



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24. Jane cuts a cake with a cross-sectional area of $1{,}920$ cm^2 into 5 identical rectangular pieces as shown in the figure below.



What is the total length of the sides that Jane cut to divide the cake into these pieces?

(4.5 Marks)

25. Nicha has a total of 6 books. Among these, there is 1 book in Chinese and 2 books in English. The rest are in Thai. Nicha wants to arrange the books in a row on a shelf so that:

- The first and last books must be in English book.
- The Chinese book must be placed near the English books.

How many ways can Nicha arrange the books according to these conditions?

(4.5 Marks)

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GRADE 7 ANSWER KEY

No.	Answer	No.	Answer
1	15	14	345
2	6	15	38
3	3	16	330
4	9	17	382.89
5	40.19	18	50
6	97.5	19	0.01
7	140	20	6
8	70	21	371
9	67	22	0
10	5	23	35
11	3	24	112
12	168	25	24
13	345		

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