1. Given that $\left(2^2\right)^{2+\frac{3c}{2}} = \left(3^3\right)^{c+1\frac{1}{3}} \div \left[\left(\frac{6}{4}\right)^2 \cdot \left(\frac{3}{2}\right)^{a+2b-4}\right]$. Find the value of $\left(a+2b-3c\right)^2 + 15$. **(2.5 Marks)**

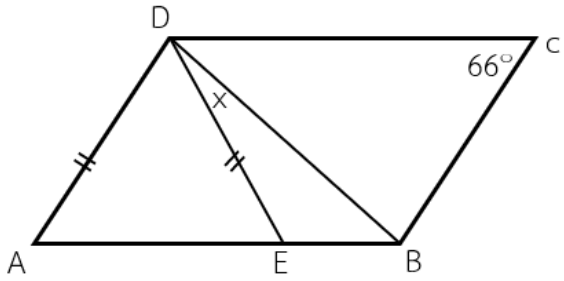
2. If the straight lines $mx + y + n = 0$ and $x - 2my + 9mn = 0$ intersect the X-axis at the same point, then find the value of $\left|\frac{1}{m^2}\right|$. **(2.5 Marks)**

3. A set of data consists of 100 distinct integers, which are arranged in ascending order such that each number is consistently greater than the preceding number by the same amount. If the 44^{th} data point is 0 and the difference between the largest and smallest values in this data set is 297, find the sum of the data points whose order is divisible by 22. **(2.5 Marks)**

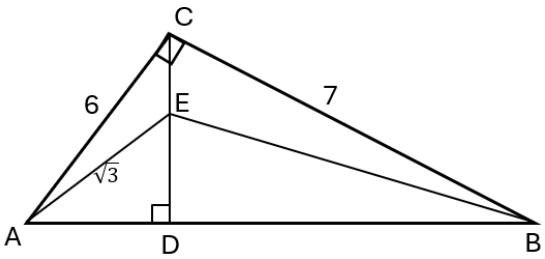
Copyright © 2025 ASMOPSS. All Rights Reserved.

4. Given that $\frac{1}{x-2a}\left[\frac{1}{x-1}+\frac{1}{x-7}\right]=\frac{b}{x^2-8x+c}$ where $a, b,$ and c be prime numbers. Find the remainder when c is divided by $a+b$. **(2.5 Marks)**

5. From the diagram, $\square ABCD$ is a parallelogram. Suppose that $D\hat{B}E=a^\circ, D\hat{B}C=2a^\circ$ and $B\hat{D}E=x^\circ$. Find the value of $\frac{a^2-x^2}{2}$. **(2.5 Marks)**



6. From the diagram, find the length of BE. **(2.5 Marks)**



Copyright © 2025 ASMOPSS. All Rights Reserved.

7. Suppose that the triangle ABC has the following conditions:

- Coordinates of points A and B are $(1,-1)$ and $(10,1)$, respectively.
- A line $y = 2x - 3$ passes through points A and $C(a,b)$
- The slope of side BC does not exist.

Find the value of $\left(a+b\right)^2$. **(2.5 Marks)**

8. The right triangle has legs of length 3 and 4, respectively. If its area is increased to 3 times the original, what is the length of the hypotenuse of the new right triangle? (Given that $\sqrt{3} = 1.73$.) **(2.5 Marks)**

Copyright © 2025 ASMOPSS. All Rights Reserved.

9. Let the fraction $\frac{x}{y}$ be in its simplest form such that

$$\frac{x}{y}=\frac{1}{2\sqrt{1}+1\sqrt{2}}+\frac{1}{3\sqrt{2}+2\sqrt{3}}+\frac{1}{4\sqrt{3}+3\sqrt{4}}+\ldots+\frac{1}{49\sqrt{48}+48\sqrt{49}}.$$

Find the product of x and y. **(4.5 Marks)**

10. Find the value of $p^2+q^2+r^2$, where p, q and r satisfy the equations

$p+q+r=3$ and $\left(1+\frac{2}{p}\right)\left(1+\frac{2}{q}\right)\left(1+\frac{2}{r}\right)=1$. **(4.5 Marks)**

Copyright © 2025 ASMOPSS. All Rights Reserved.

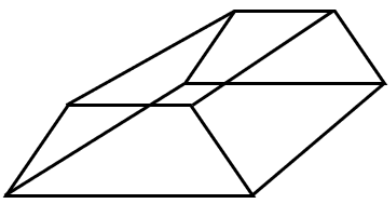
11. Let $u, v,$ and w be integers such that $4^u = 32^v = 128^w$. Find the sum of all possible values of u that make $\frac{2uv-u^2}{u}+\frac{2vw-v^2}{v}+\frac{2uw-w^2}{w}$ a prime number. **(4.5 Marks)**

12. What is the sum of square of all roots of the equation $\sqrt{1+\sqrt{1+x}} = \sqrt[3]{x}$? **(4.5 Marks)**

Copyright © 2025 ASMOPSS. All Rights Reserved.

13. A window maker needs to bend steel to create frames in the shape of a square, a circle, and an equilateral triangle. The equilateral triangle is inscribed in the circle, and the circle is inscribed in the square. If the square has a side length of 80 cm, what is the total length of steel, in meters, that he will need to make 7 frames? (Given that $\sqrt{3}=\frac{7}{4}, \pi=\frac{22}{7}$.) **(4.5 Marks)**

14. Adam ordered a 5-pound loaf of trapezoidal bread with a height of 6 inches and a length of 10 inches. Suppose that the two parallel sides of the trapezoid are the smallest possible pair of different prime numbers. What is the minimum area of wrapping paper (measured lengthwise) that can completely wrap the bread? (Given that 1 pound $=180$ cubic inches, $\sqrt{2}=1.4, \sqrt{5}=1.7$.) **(4.5 Marks)**

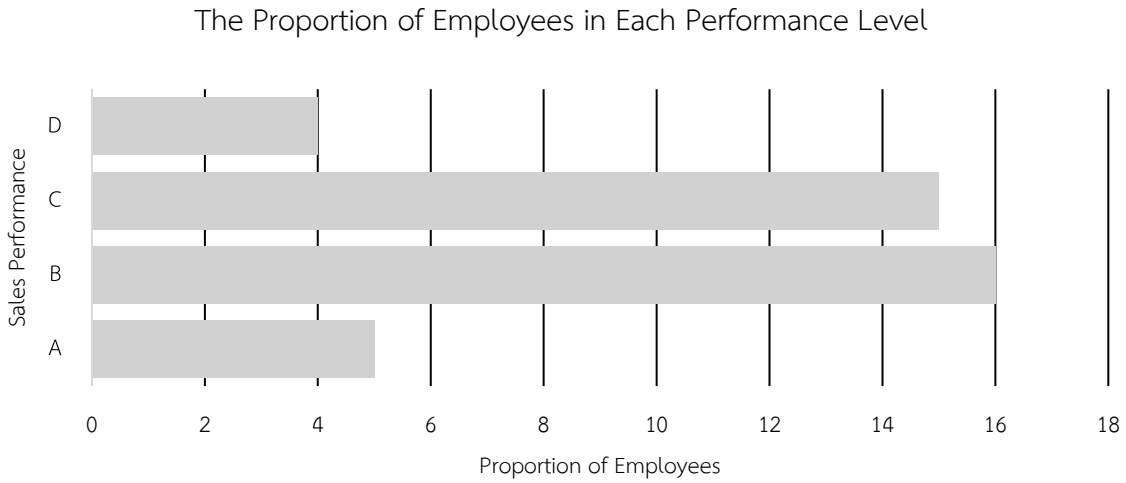


Copyright © 2025 ASMOPSS. All Rights Reserved.

15. ASMOPSS Insurance Company classifies employee sales performance into four levels: D, C, B, and A. Each level receives a different percentage of compensation from insurance sales per month, as shown in the table below.

Sales Performance Level	Monthly Insurance Sales (THB)	Commission Rate (%)
D	Less than $15,000$ THB	5%
C	From $15,000$ THB but less than $30,000$ THB	10%
B	From $30,000$ THB but less than $50,000$ THB	15%
A	From $50,000$ THB onwards	20%

According to the survey, the proportion of employees achieving each sales performance level is shown in the bar chart below.



If employees with sales ability at level C receive a total commission of $517,500$ baht, what is the maximum number of employees at this insurance company? **(4.5 Marks)**

Copyright © 2025 ASMOPSS. All Rights Reserved.

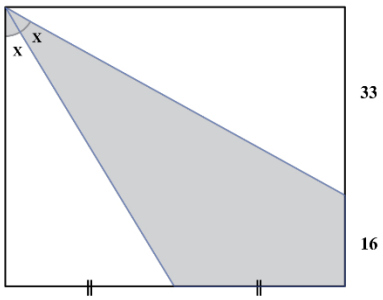
16. Let x and y be distinct positive integers. The LCM of x, y and the product of x, y are 112 and $2{,}128$, respectively. What is the difference between the largest positive integer less than or equal $\dfrac{10^{37}}{10^{34}+3}$ and the GCD of x, y?

(6 Marks)

17. Jeff drove from Siam to Kanchanaburi, a distance of 120 km. After driving half the distance at a constant speed, his engine malfunctioned, forcing him to reduce his speed by 8 km/h. This caused him to arrive 22.5 minutes late. If his car had no problems, how much should he have increased his speed to arrive in Kanchanaburi within a maximum of 54 minutes? **(6 Marks)**

Copyright © 2025 ASMOPSS. All Rights Reserved.

18. A jade craftsman has obtained a piece of jade (shaded area) that is 1 inch thick and has the dimensions shown in the figure. This piece of jade is carved into small beads with a diameter of 1 inch. The loss of jade during turning is 21.5%. If each bead sells for 300 baht, how many thousand baht does the craftsman earn from selling all the jade beads? **(6 Marks)**



19. A regular octagon with an area of $200\sqrt{2}$ square units is inscribed in a circle. Find the perimeter of the largest regular hexagon that can be inscribed within the same circle. **(6 Marks)**

Copyright © 2025 ASMOPSS. All Rights Reserved.

20. Let a be a positive integer that 1.99584×10^9 is divisible by a. If a is randomly selected, find the probability that a is an odd number? **(6 Marks)**

21. Scientists observed the growth of four identical specie trees. The trees had a constant and equal growth rate. Scientists did not apply fertilizer to the first three trees. After 4 days, the total height of these three trees is 12 centimeters. However, scientists applied fertilizer to the fourth tree. This tree reacts differently: its growth rate doubles every two days. How many centimeters of total height growth will be observed from all four trees after 8 days? **(2.5 Marks)**

Copyright © 2025 ASMOPSS. All Rights Reserved.

22. Let $3^{4x+2} - 9^{2x-1} + 81^{x} = 89$. What is the approximate value of $\sqrt{x}$? (Given that $\sqrt{2} = 1.414$.) **(4.5 Marks)**

23. A factory has $125,000$ cubic centimeters of water, which can exactly fill 8 cubic tanks. Each tank has a diagonal length inside the tank equal to $5x\sqrt{3}$ centimeters. Find the value of x that satisfies this condition. **(2.5 Marks)**

Copyright © 2025 ASMOPSS. All Rights Reserved.

24. Let $A(a,b), B(a,7b)$ and $C(-9,b)$ be points on the rectangular coordinate plane. Given that:

- Point B is the result of rotating point C about point A 270° counterclockwise.
- Point $D(4b,b)$ is the result of reflecting point C across the line $x=-\frac{1}{2}$
- Point E is the result of translating point D by the vector $(-17,12)$

Find the area of quadrilateral $BECD$. **(4.5 Marks)**

25. How many triangles with an area of 60 square units can be constructed with vertices at $(x,0), (x,y),$ and the origin, where x and y are integers?

(4.5 Marks)

Copyright © 2025 ASMOPSS. All Rights Reserved.

GRADE 8 ANSWER KEY

No.	Answer	No.	Answer
1	51	14	632.32
2	9	15	920
3	132	16	980
4	3	17	26.67, 93.33
5	330	18	509.84, 510.3
6	4	19	60
7	729	20	0.1
8	8.65	21	54
9	42	22	0.71
10	29	23	5
11	35	24	174
12	64	25	64
13	54.7		

Copyright © 2025 ASMOPSS. All Rights Reserved.