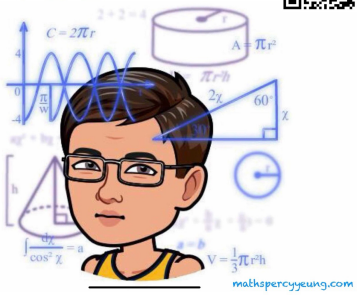


Form 2 Mathematics

First Examination Revision Exercise-1- 3

[2022-2023 First Examination Paper]

Paper I

Section A Short Questions (28 marks)

1. The weight of a girl is shown in Figure 1.

   (a) Write down the measured weight of the girl.

   (b) Find the maximum absolute error of the measurement.

   (c) Find the range of the actual weight of the girl.

   (4 marks)

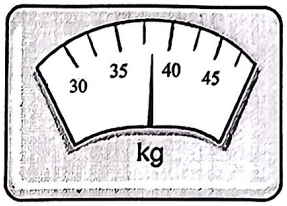


Figure 1

2. If $A(x+2)-7\equiv 3(x-1)-B$, find the values of A and B. (4 marks)

3. (a) Factorize $(2a+c)(a-b)+(b-a)(c-2a)$.

   (b) Hence, factorize $(2a+c)(a-b)+(b-a)(c-2a)-4ab$.

   (4 marks)

4. A school is planning for a BBQ. The total cost $\$E$ of the BBQ can be calculated by the formula $E=1200+30n$, where n is the number of students who join the BBQ.

   (a) Make n the subject of the formula.

   (b) If the total cost of the BBQ is $\$3600$, find the number of students who join the BBQ.

   (4 marks)

5. In Figure 2, $BC//ED$ and $AE=ED$. $\angle ABC=140°$, $\angle ADC=55°$ and $\angle AED=132°$. Find x and y. (4 marks)

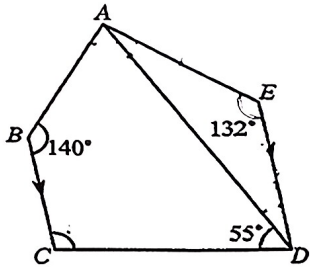


Figure 2

6. In Figure 3, $\Delta PQR\cong\Delta SRT$. It is given that $QR=3$ cm, $TS=8$ cm, $TR=a$ cm, $PT=b$ cm and $RS=(2b-a)$ cm.

   (a) Find the values of a and b.

   (b) Find the perimeter of ΔPQR.

   (4 marks)

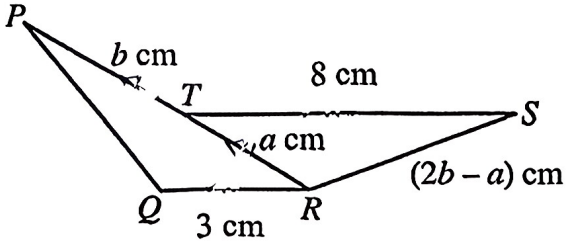
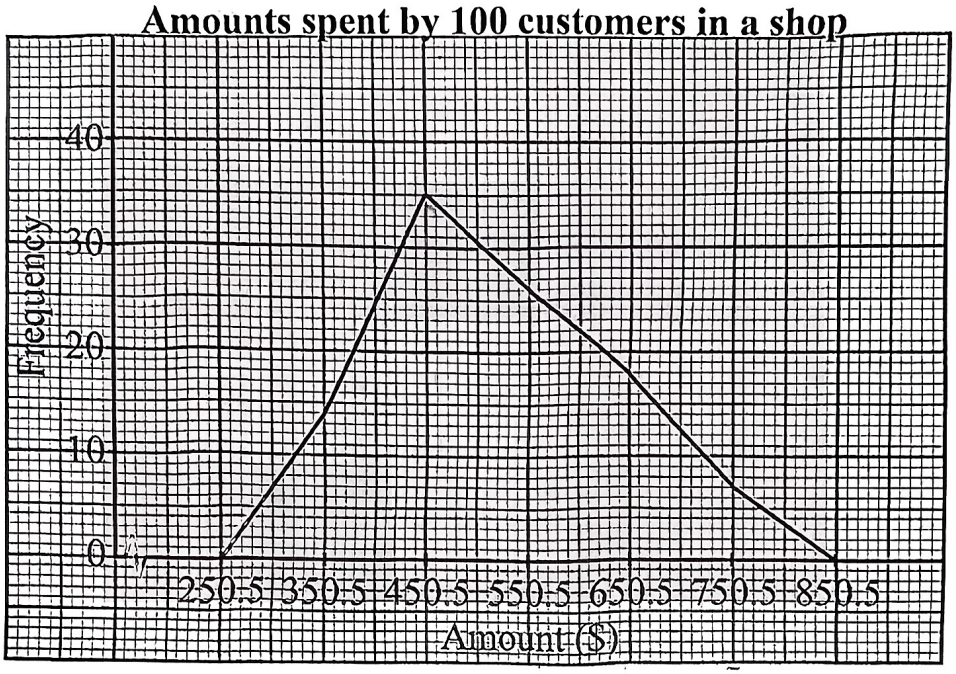


Figure 3

7. The following frequency polygon shows the amounts spent (in $) by 100 customers in a shop.



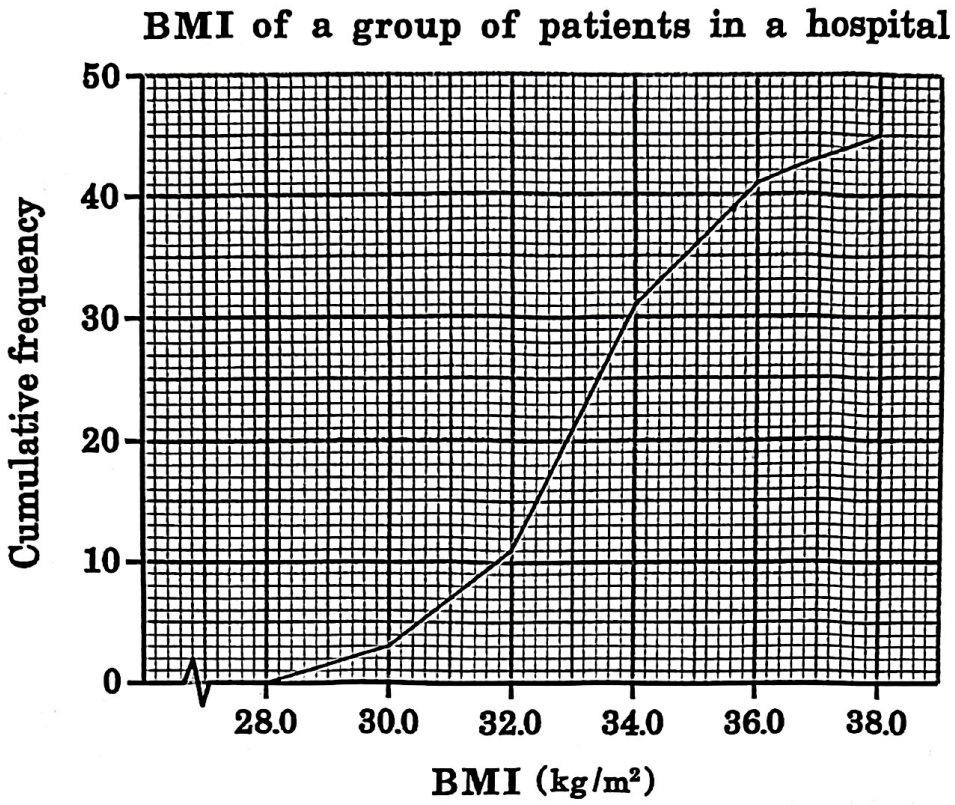
(a) Find the class width of each class.

(b) Write down the upper class boundary of the class interval with the lowest frequency.

(c) The shopkeeper claims that at least half of the customers spent more than $500.5.
Do you agree? Explain your answer.

(4 marks)

8. The cumulative frequency polygon below shows the BMI of a group of patients in a hospital.



(a) It is given that 15 patients have BMI less than x kg/m^2. Find the value of x.

(b) How many patients have BMI less than 33.0 kg/m^2 ?

(c) Jason is one of the patients and his BMI is 35.6 kg/m^2. Suppose 20% of the patients with the highest BMI have to take low calorie meals. Should Jason take a low calorie meal? Explain your answer.

(4 marks)

9. Printer A can print 135 pages in 2.5 minutes, while printer B can print 68 pages in 80 second.

(a) Find the printing speed of the printer A in page(s)/min.

(b) How many pages can the printer A print in 50 seconds?

(c) How long does it take for printer B to print 85 pages?

(4 marks)

Section B (28 marks)

10. The length of a side of a metal solid cube is measured as 4 cm and the percentage error is 5%.

(a) Find the upper limit of the length of a side of the cube. (2 marks)

(b) Find the maximum possible volume of the cube. (2 marks)

(c) Is it possible to melt the metal solid cube and form 20 small metal cubes, with each volume measured as 3.70 cm^3 correct to the nearest 0.01 cm^3? Explain your answer.

(2 marks)

11. (a) Factorize $2ab+2b^2-a^2-ab$. (2 marks)

(b) By using (a), simplify $\dfrac{2ab+2b^2-a^2-ab}{2a}\times\dfrac{a^2+a}{2b-a}$. (2 marks)

(c) Hence, or otherwise, simplify $\dfrac{2ab+2b^2-a^2-ab}{2a}\times\dfrac{a^2+a}{2b-a}-a(a+b)$. (2 marks)

12. Figure 4 shows a regular pentagon $ABCDE$. Given that $BC=BM=DM$.

(a) Prove that $\Delta MDC\cong\Delta MBC$. (2 marks)

(b) Is AD parallel to BC? Explain your answer. (2 marks)

(c) Find $\angle AME$. (2 marks)

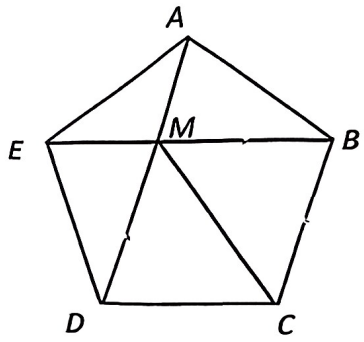


Figure 4

13. In a bag, there are some \$1-coins, \$2-coins and \$5-coins. The ratio of the numbers of \$1-coins and \$2-coins is $3:2$. The ratio of the numbers of \$2-coins and \$5-coins is $4:5$.

(a) Find the number of \$1-coins : number of \$2-coins : number of \$5-coins. (1 mark)

(b) If the total value of the coins is \$351, find the total number of coins in the bag. (3 marks)

(c) If 20 \$5-coins are taken away, will the total value of \$5-coins in the bag is less than the total value of \$1-coins and \$2-coins? Explain your answer. (2 marks)

2223 F.2 1st Exam Paper II

1. Expand $(2x-5y)^2$.

   A. $4x^2-20xy+25y^2$

   B. $4x^2-20xy-25y^2$

   C. $4x^2+25y^2$

   D. $4x^2-25y^2$

2. $36h^2-15h=$

   A. $3h(5+12h)$

   B. $-3h(5+12h)$

   C. $3h(5-12h)$

   D. $-3h(5-12h)$

3. $2xh-y-x+2yh=$

   A. $(x-y)(2h-1)$

   B. $(x-y)(2h+1)$

   C. $(x+y)(2h-1)$

   D. $(x+y)(2h+1)$

4. If $4x^2+Bx+C\equiv Ax(2x-1)$, find the values of A,B and C.

   A. $A=2,B=2,C=1$

   B. $A=2,B=-2,C=0$

   C. $A=-2,B=2,C=1$

   D. $A=-2,B=-2,C=0$

5. Factorize $16x^4-72x^2y^2+81y^4$.

   A. $(2x-3y)^4$

   B. $(4x^2+9y^2)^2$

   C. $(2x+3y)^2(2x-3y)^2$

   D. $(4x+9y)^2(4x-9y)^2$

6. Which of the following is an algebraic fraction / are algebraic fractions?

I. $\frac{2}{x-1}$

II. $\frac{3}{5}$

III. $\frac{x-3}{x+1}$

A. I only

B. I and III

C. II and III

D. I, II and III

7. Simplify $\frac{-3x^2yz^4}{15xy^5z^4}$

A. $-\frac{x}{5y^4}$

B. $-\frac{xz}{5y^4}$

C. $\frac{xy^4}{5z}$

D. $-\frac{xy^4}{5z}$

8. Simplify $\frac{5}{3(5+k)}-\frac{3}{2(5+k)}$.

A. $\frac{2}{5+k}$

B. $\frac{3}{2(5+k)}$

C. $\frac{1}{6(5+k)}$

D. $-\frac{1}{6(5+k)}$

9. In a quiz of 10 questions, 10 marks will be awarded for each correct answer, 5 marks and 3 marks will be deducted for each wrong answer and for giving no response respectively. Suppose Alex gets x correct answers and y wrong answers, which of the following formula should be used to calculate the total marks T correctly?

A. $T = 10x - 5y$

B. $T = 7x - 8y - 30$

C. $T = 13x - 8y - 30$

D. $T = 13x - 2y - 30$

10. Make b the subject of the formula $P = (a + b)x + (a - b)y$.

A. $b = \frac{P+a(x+y)}{x-y}$

B. $b = \frac{P+a(x-y)}{x+y}$

C. $b = \frac{P-a(x-y)}{x+y}$

D. $b = \frac{P-a(x+y)}{x-y}$

11. The lower limit and the upper limit of the length of a wire are 37 cm and 43 cm respectively. Find the maximum absolute error of the measurement.

A. 1.5 cm

B. 3 cm

C. 6 cm

D. 40 cm

12. The actual price of a diamond is \$200 500. If the price is rounded off correct to 2 significant figures, find the absolute error made by this approximation.

A. \$500

B. \$1 000

C. \$5 000

D. \$10 000

13. The height of a flat is 3.42 m, correct to the nearest 0.03 m. Which of the following cannot be the actual height of the flat?

A. 3.405 m

B. 3.415 m

C. 3.425 m

D. 3.435 m

14. The weight of a laptop computer is 2.1 kg, correct to the nearest 0.1 kg. Find the relative error of the measurement.

A. $\frac{1}{84}$

B. $\frac{1}{42}$

C. $\frac{1}{21}$

D. $\frac{2}{21}$

15. A gold medal weighs 250 g, correct to the nearest x g. If the percentage error is 2%, find the value of x.

A. 1.25

B. 2.5

C. 5

D. 10

16. A piece of string of length 11.7 cm is cut into two parts. The length of first part is 7.2 cm. Both measurements are corrected to 1 decimal place. Find the upper limit of the length of second part.

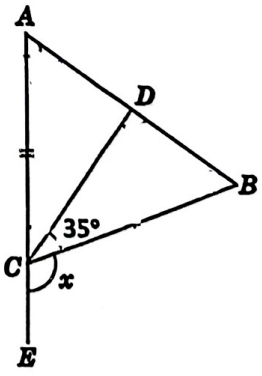
A. 4.5 cm

B 4.6 cm

C. 4.7 cm

D. 4.8 cm

17. In the figure, C and D are points on AE and AB respectively. $AC = BC$. $CD \perp AB$. $\angle BCD = 35°$. Find x.



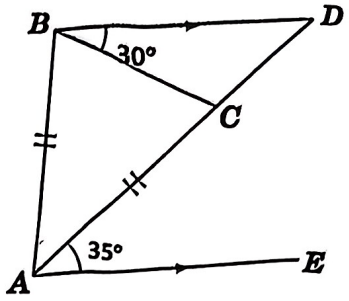
A. 110°

B. 115°

C. 125°

D. 145°

18. In the figure, ACD is a straight line. It is given that $AE \parallel BD$ and $AB = AC$. $\angle CBD = 30°$, $\angle DAE = 35°$ Find $\angle CAB$.



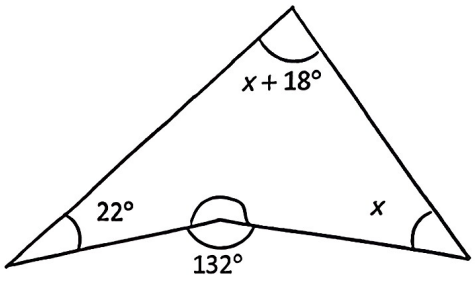
A. 35°

B. 50°

C. 65°

D. 70°

19. Find x in the figure.



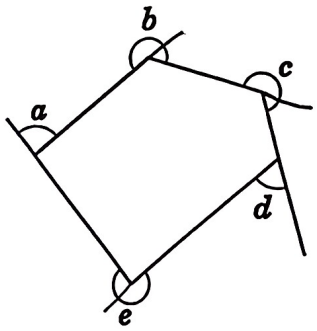
A. 36°

B. 38°

C. 46°

D. 48°

20. Refer to the figure. Find $a + b + c + d + e$.



A. 360°

B. 540°

C. 720°

D. 900°

21. Which of the following regular polygons cannot tessellate?

A. Equilateral triangles

B. Squares

C. Regular pentagons

D. Regular hexagons

22. It is given that $\Delta ABC \cong \Delta PQR$. $\angle ABC = 47°$ and $\angle ACB = 54°$. Which of the following is correct?

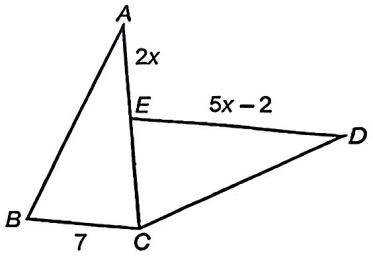
A. $\angle BAC = 99°$

B. $\angle PRQ = 47°$

C. $\angle PQR = 54°$

D. $\angle QPR = 79°$

23. In the figure, $\Delta ABC \cong \Delta DCE$. $AE = 2x, ED = 5x - 2, BC = 7. x =$



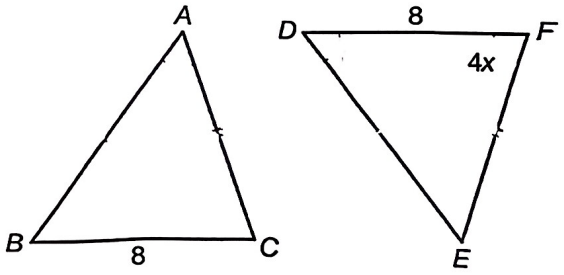
A. 2.

B. 2.5.

C. 3.

D. 3.5.

24. In the figure, $x =$



A. 18°.

B. 27°.

C. 30°.

D. 36°.

25. Consider two triangles ABC and DEF. Which of the following CANNOT give enough information for $\Delta ABC \cong \Delta DEF$?

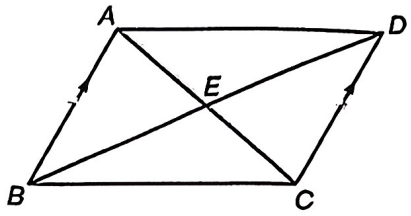
A. $AC = DF, CB = FE, \angle A = \angle D$

B. $AB = DE, \angle A = \angle D, \angle B = \angle E$

C. $AC = DF, \angle B = \angle E, \angle C = \angle F$

D. $AB = DE, BC = EF, \angle B = \angle E$

26. In the figure, AC and BD intersect at E. $BA \parallel CD$ and $AB = CD$. Which of the following must be correct?



I. $\Delta ABC \cong \Delta CDA$

II $\Delta ABE \cong \Delta DCE$

III. $\Delta ABD \cong \Delta CDB$

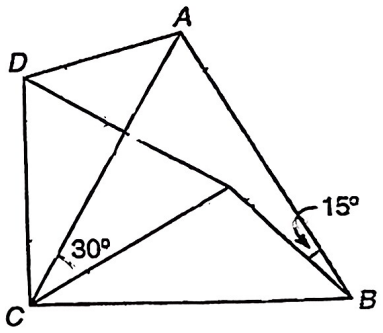
A. I and II only

B. I and III only

C. II and III only

D. I, II and III

27. In the figure, ABC and CDE are two equilateral triangles. If $\angle ACE = 30°$ and $\angle ABE = 15°$, then $\angle ADE =$



A. $75°$.

B. $60°$.

C. $45°$.

D. $30°$.

28. The frequency distribution table below shows the favourite fruits of a group of students.

Fruit	Apple	Mango	Peach	Orange
Frequency	7	5	6	9

Which of the following is/are suitable to present the above data?

I. Bar chart

II. Pie chart

III. Histogram

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

29. The frequency distribution table below shows the hourly wages of 30 people.

Hourly wage ($)	Frequency
30–49	5
50–69	*x*
70–89	11
90–109	2

Find the upper class boundary of the class interval with the highest frequency.

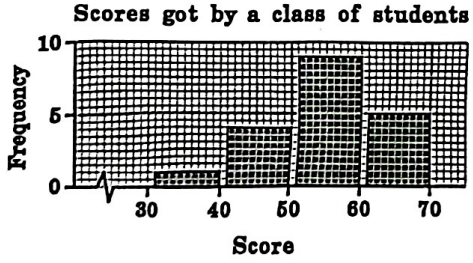
A. $49.5
B. $69
C. $69.5
D. $89.5

30. The frequency distribution table below shows the scores got by a class of students in a test.

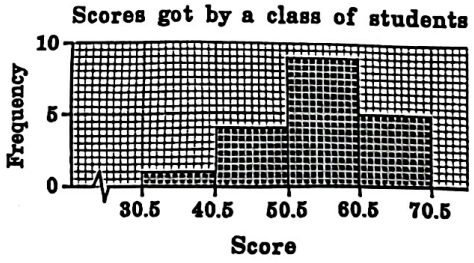
Score	*31–40*	*41–50*	*51–60*	*61–70*
Frequency	1	4	9	5

Which of the following can be the histogram constructed according to the data?

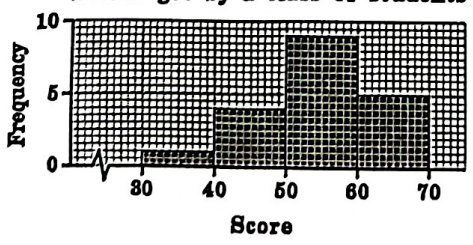
A.



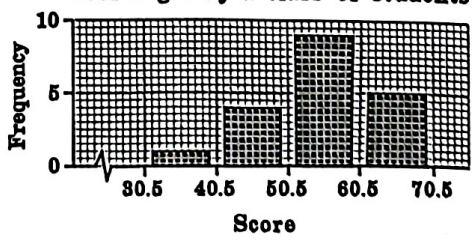
C.



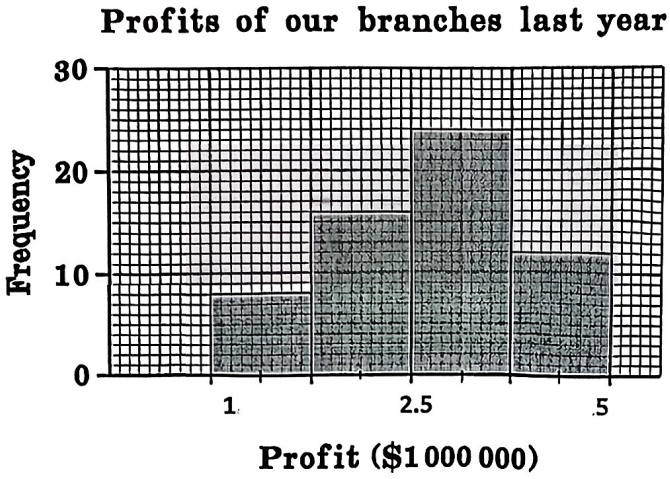
B.



D.



31. The president of a chain store constructs the following histogram by using the data of the branches which made profits last year.



The president makes the following claims:

I. There are 16 branches which made profits between $2 000 000 and $3 000 000.

II. Most of the branches made profits of $3 000 000 or above.

III. The top branch made a profit of $5 000 000.

Which of the above claim(s) must be correct?

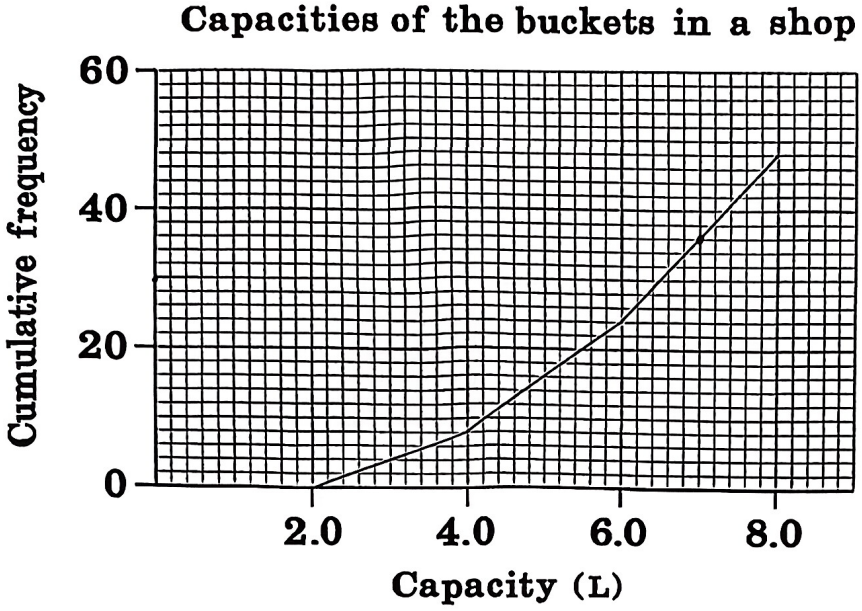
A. I only

B. III only

C. I and II only

D. II and III only

32. The cumulative frequency polygon below shows the capacities of the buckets in a shop.



What percentage of the buckets in the shop have capacities 7.0 L or above?

A. 20%

B. 25%

C. 60%

D. 75%

33. The following cumulative frequency curve shows the number of trees planted every day over the past 120 days.

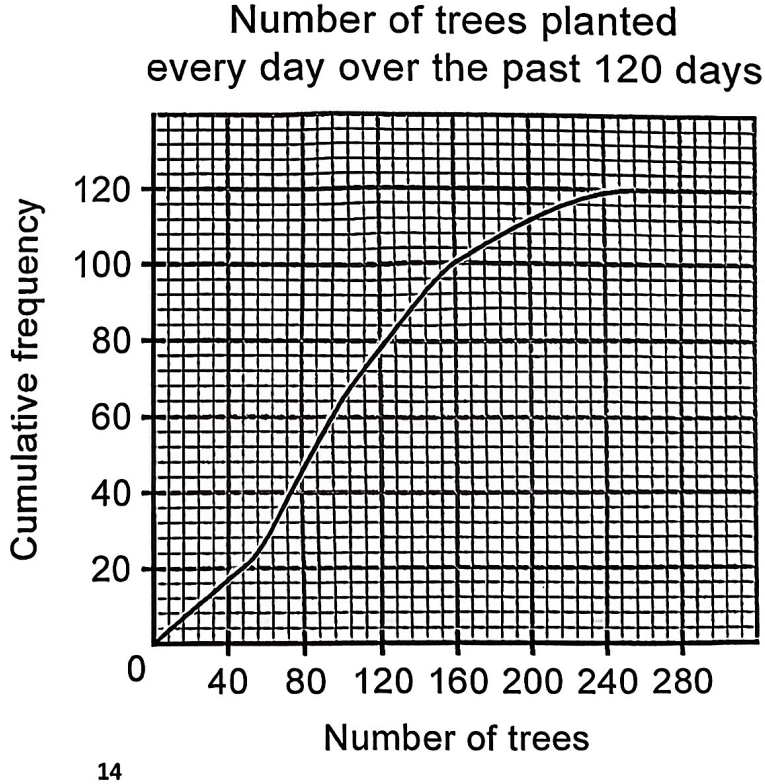
Find the 20th percentile (P_{20}).

A. 30

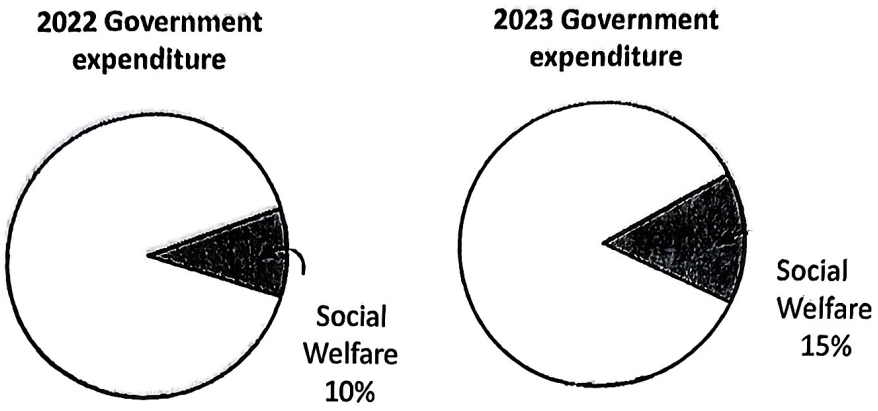
B. 44

C. 48

D. 56



34. The figure shows the expenditures of government in 2022 and 2023 respectively.



Which of the following(s) must be correct?

I. The expenditure in social welfare bas increased from 2022 to 2023.

II. The expenditure in social welfare in 2022 is $\frac{2}{3}$ of the expenditure in social welfare in 2023.

III. The percentage of the government expenditure in social welfare has increased from 2022 to 2023.

A. III only

B. I and II only

C. I and III only

D. II and III only

35. Determine whether a rate or a ratio should be used to relate the quantities in each of the following sentences.

(i) A factory produces 9000 watches in 15 days.

(ii) Nancy has $150 and May has $300

	(i)	(ii)
A.	Rate	Rate
B.	Rate	Ratio
C.	Ratio	Rate
D.	Ratio	Ratio

36. Which of the following cars has the highest speed?

A. Car A: 800 m/min

B. Car B: 0.9 km/min

C. Car C: 15 m/s

D. Car D: 60 km/h

37. In a bank, we can exchange Euros (EUR), British Pound (GBP) with Hong Kong Dollars (HKD). Suppose we can exchange EUR 1 for HKD 8.8 and GBP 1 for HKD11. How much GBP can we exchange for EUR 100?

A. GBP 80

B. GBP 96.8

C. GBP 125

D. GBP 198

38. If $8 : 7 = 12 : y$, find the value of y.

A. $\frac{3}{2}$

B. $\frac{15}{2}$

C. $\frac{21}{2}$

D. 11

39. It is given that a, b and c are non-zero numbers. If $8a = b = 2c$, then $a : b : c =$

A. 8 : 1 : 2.

B. 2 : 1 : 8.

C. 1 : 4 : 8.

D. 1 : 8 : 4.

40. The costs of brand P flour and brand Q flour are \$30/kg and \$42/kg respectively. If x kg of brand P flour and y kg of brand Q flour are mixed, then the cost of the mixture is \$35 kg. Find $x : y$.

A. 5 : 7

B. 7 : 5

C. 65 : 77

D. 77: 65