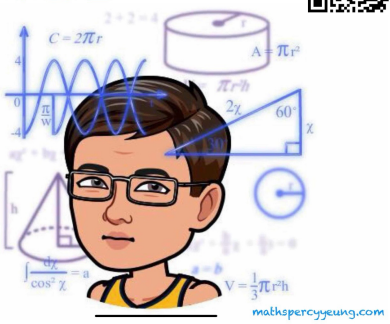


Form 2 Mathematics
First Examination Revision Exercise 1
[2024-2025 First Examination Paper]

Paper I

1. (a) Sam measures the weight of a melon as 824 g, correct to the nearest 4 g. Find the percentage errors of Sam's measurement. (*Give the answers correct to the nearest 0.1%.*)
   (b) Abby measures the weight of the same melon with a percentage error 0.3%. Someone claims that Sam's measurement is more accurate. Do you agree? Explain your answer. (4 marks)

2. If $5(3+Ax)-x(x-3)+A\equiv -x(x-B)+17$, find the values of A and B. (4 marks)

3. (a) Factorize $9x^2-24x+16$.
   (b) Hence, factorize $9x^2-24x+16-16y^2$. (4 marks)

4. Simplify the following expressions.
   (a) $\dfrac{u-v}{v+8}\times\dfrac{u+v}{v-u}$
   (b) $\dfrac{1}{3y+1}-\dfrac{1}{3y-1}$ (4 marks)

5. In Figure 1, $\triangle ABD\cong\triangle CDB$. Given that $AB=4$ cm, $BC=5$ cm, $\angle BDC=40°$ and $\angle CBD=30°$.
   (a) Find x.
   (b) Find the perimeter of quadrilateral $ABCD$. (4 marks)

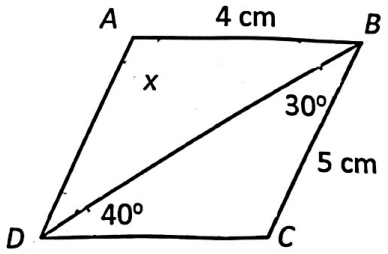


Figure 1

6. In Figure 2, $BC\ //\ AF$. Given that $AE=BE$, $\angle BAE=x$, $\angle BCD=y$, $\angle CBE=2x+10°$, $\angle DEF=28°$ and $\angle CDE=90°$. Find x and y. (4 marks)

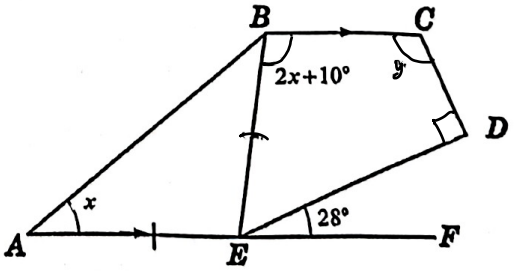


Figure 2

7. The table below shows the frequency distributed table and the cumulative frequency table of the weights of a group of students.

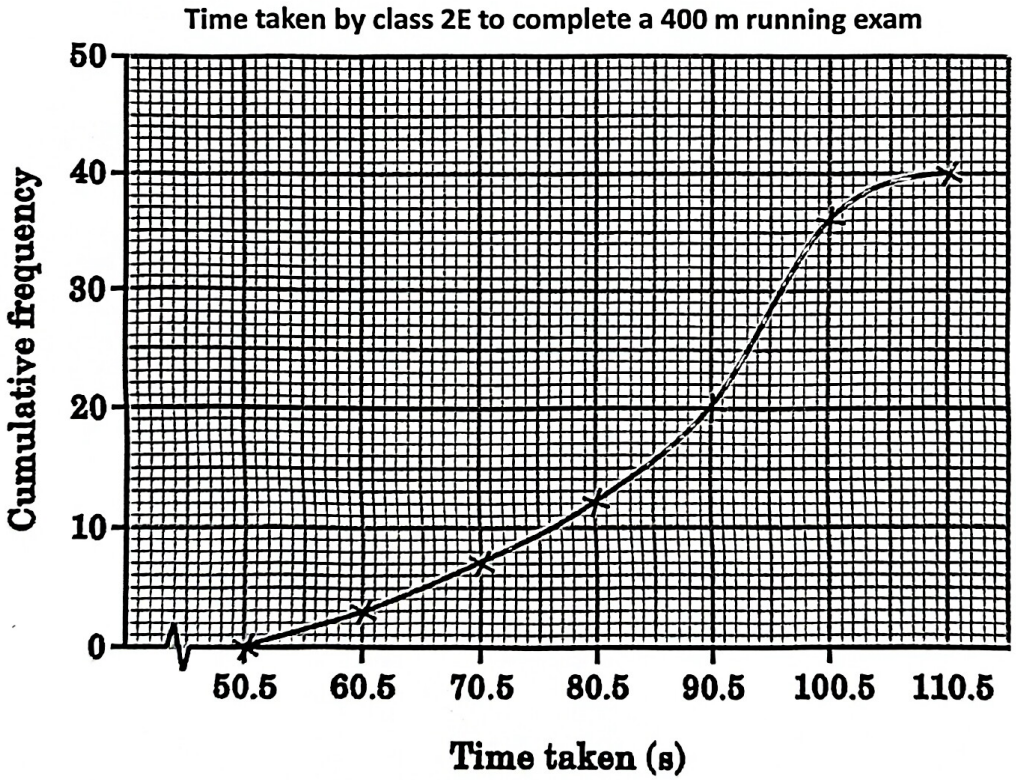
Weight (kg)	Frequency
31–35	a
36–40	16
41–45	b
46–50	20
51–55	18

Weight less than (kg)	Cumulative frequency
30.5	0
35.5	12
40.5	c
45.5	52
50.5	72
55.5	90

(a) Write down the values of a, b and c.

(b) Mr. Wong claims that more than half of the students' weights are between 40.5 kg and 50.5 kg. Do you agree? Explain your answer. (4 marks)

8. The cumulative frequency polygon below shows the time taken by class 2E to complete a 400 m running exam.



(a) Find the upper quartile of the time taken.

(b) Find the number of students run between 70.5 s and 90.5 s.

(c) The top 10% of the fastest students will receive an 'A' grade in the exam. Among the students receiving an 'A' grade, Mary has the slowest time. What is Mary's slowest possible time? (4 marks)

On a bookshelf, there are Chinese books and English books only. The numbers of Chinese books and English books are in the ratio 8 : 3. It is given that there are 30 more Chinese books than the English books.

(a) Find the numbers of Chinese books on the bookshelf.

(b) If 4 Chinese books are taken away and replaced with 4 English books, find the ratio of the number of Chinese books to the number of English books on the bookshelf now. (4 marks)

10. The temperature inside a room is measured by a thermometer as 31.5°C. The relative error of the measurement is $\frac{1}{126}$.

(a) Find the maximum absolute error of the measurement. (2 marks)

(b) If the actual temperature in the room is x°C, find the range of values of x. (2 marks)

(c) After turning on the air-conditioner, the actual temperature becomes 26.8°C. Tony claims that the temperature can be lowered by 5°C. Do you agree? Explain your answer. (2 marks)

11. Mandy can run 800 m in 1 minute and 36 seconds.

(a) Find her running speed in m/s. (1 mark)

(b) Mandy joined a 10 km race and plans to complete it with an average speed that is 60% of her speed in (a).

(i) Could she finish the race in 30 minutes? Explain your answer.

(ii) If she aims to complete the race in 28 minutes and increases her speed to x km/h after 20 minutes, find the value of x. (5 marks)

12. In a cinema, students have a 40% discount on the price of an adult ticket. Suppose the price of an adult ticket is \$$T$. A group of p people including q students buy tickets in the cinema to watch the movie. Let the selling price of all tickets be \$$F$.

(a) Show that $F = Tp - 0.4Tq$. (2 marks)

(b) Make q the subject of the formula obtained in (a). (2 marks)

(c) A group of 60 people go to the cinema to see the movie. If the price of an adult ticket is \$80, they have to pay \$3 200 in total. Jason claims that over 80% of them are students. Do you agree? Explain your answer. (2 marks)

13. In Figure 3, $ABCD$ is a square. EGF and DHF are straight lines.
Given that $\angle DEF = 80°$, $\angle EGC = 120°$ and $ED = EF$.

(a) Find $\angle CHF$. (3 marks)

(b) Prove that $\Delta ADE \cong \Delta CDH$. (3 marks)

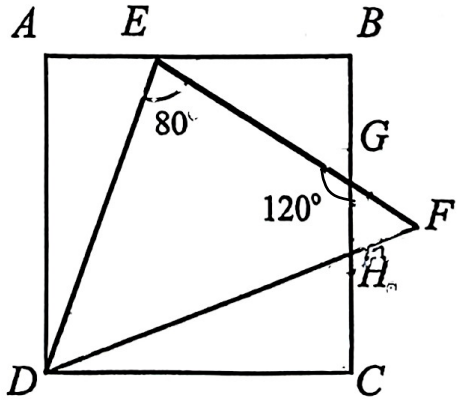


Figure 3

Paper II

1. $\left(x^2+\frac{3}{4}\right)\left(x^2-\frac{3}{4}\right)=$

   A. $x^2-\frac{9}{16}$

   B. $x^4-\frac{3}{8}$.

   C. $x^4-\frac{9}{16}$

   D. $x^4-\frac{3}{2}$.

2. $(-a-3b)^2=$

   A. $-a^2-9b^2$.

   B. $-a^2-6ab-9b^2$

   C. $a^2+6ab+9b^2$.

   D. $a^2-6ab+9b^2$

3. $5(x+y)^2-10(x+y)z=$

   A. $5(x+y)(x+y+2z)$.

   B. $5(x+y)(x-y-2z)$.

   C. $5(x+y)(x-y+2z)$.

   D. $5(x+y)(x+y-2z)$.

4. $2ac+14a-bc-7b=$

   A. $(c+7)(2a-b)$.

   B. $(c-7)(2a+b)$.

   C. $(c+7)(2a+b)$.

   $(c-7)(2a-b)$.

5. $81(r+s)^2-36(r+s)+4=$

   A. $(9r-9s+2)^2$.

   B. $(9r-9s-2)^2$.

   C. $(9r+9s+2)^2$.

   D. $(9r+9s-2)^2$.

6. Simplify $\frac{r^3+r^2s-r^2}{s(s-1+r)}$.

A. $-\frac{r}{s}$

B. $\frac{r}{s}$

C. $-\frac{r^2}{s}$

D. $\frac{r^2}{s}$

7. $\frac{a^3}{a+3b}\times\frac{6b^2}{a}\div\frac{4b}{2(a+3b)}=$

A $3a^2b$

B. $3ab^3$

C. $\frac{3a^2}{b}$

D. $\frac{a^2}{3b}$

8. Simplify $\frac{3}{a-3}+\frac{7}{4-a}$.

A. $\frac{4a-9}{(a-3)(4-a)}$

B. $\frac{4a-9}{(a-3)(a-4)}$

C. $\frac{4a+9}{(a-3)(4-a)}$

D. $\frac{4a+9}{(a-3)(a-4)}$

9. If $y=cx-3(a+x)$, then $x=$

A. $\frac{y-3a}{c-3}$.

B. $\frac{y+3a}{c-3}$.

C. $\frac{y-3a}{c+3}$.

D. $\frac{y+3a}{c+3}$.

10. Make n the subject of the formula $\frac{1-m}{2m+n}=\frac{m}{n}$.

A. $n=-m$

B. $n=-2m^2$

C. $n=\frac{2m^2}{1-m}$

D. $n=\frac{2m^2}{1-2m}$

11. Suppose $x = 1\,200$, correct to 3 significant figures. Find the range of values of x.

A. $1\,195 < x \leq 1\,205$

B. $1\,195 \leq x < 1\,205$

C. $1\,150 < x \leq 1\,250$

D. $1\,150 \leq x < 1\,250$

12. The temperature of a town is –40.0°C, correct to the nearest 0.2°C. Which of the following could be its actual temperature?

A. –39.8°C

B. –39.9°C

C. –40.1°C

D. –40.2°C

13. The flight time from Hong Kong to Beijing is measured as 3.2 h and its relative error is $\frac{1}{64}$. What is the lower limit of the actual flight time?

A. 3.1 h

B. 3.15 h

C. 3.25 h

D. 3.3 h

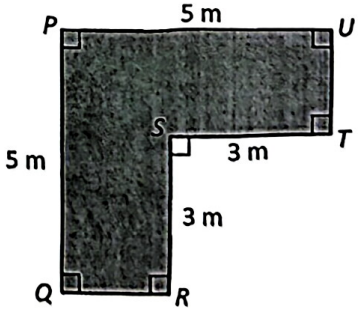
14. In the figure, *PQRSTU* is a polygon, where all the measurements are correct to the nearest m. Let x m^2 be the actual area of the polygon. Find the range of values of x.

A. $8 < x < 18$

B. $8 < x < 24$

C. $14 < x < 18$

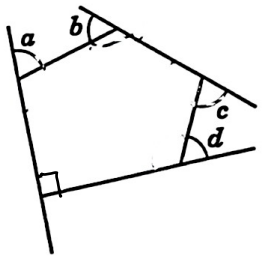
D. $14 < x < 24$



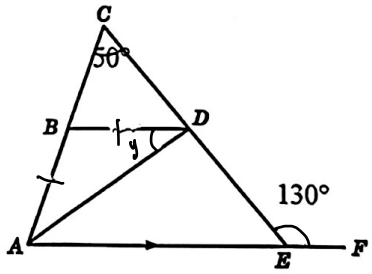
15. Ken uses a ruler with a scale interval of 0.5 cm to measure the length of each side of a square. If the length of each side is measured as 12.5 cm, find the relative error in calculating the perimeter of the square.
    A. 0.02
    B. 0.04
    C. 0.08
    D. None of the above

16. The weight of a gold coin is measured as 175 g, correct to the nearest x g. If the percentage error of this measurement is $1\frac{3}{7}\%$, what is the value of x?
    A. 2.5
    B. 5
    C. 10
    D. 15

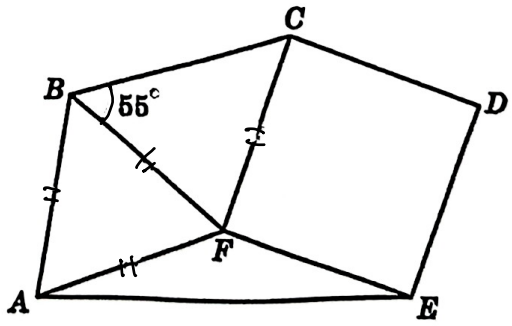
17. Refer to the figure. Find $a + b + c + d$.
    A. 180°
    B. 270°
    C. 360°
    D. 450°



18. In the figure, CBA and CDE are straight lines. It is given that $AB = BD$ and $BD \parallel AF$. Find y.
    A. 30°
    B. 35°
    C. 40°
    D. 45°



19. In the figure, $CDEF$ is a square, $AF = AB = BF = FC$ and $\angle FBC = 55°$. Find $\angle FAE$.
    A. 17.5°
    B. 20°
    C. 22.5°
    D. 25°

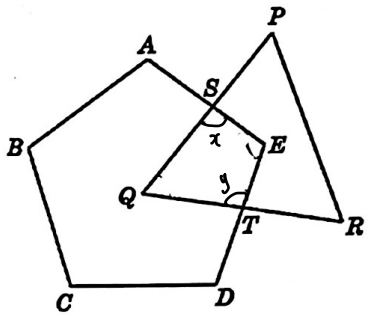


20. If the sum of interior angles of an n-sided polygon is $\frac{5}{2}$ of that of an octagon, find the value of n.

A. 17
B. 15
C. 13
D. 11

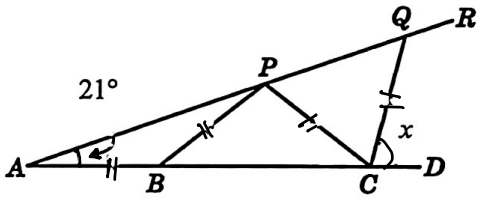
21. In the figure, $ABCDE$ is a regular pentagon and $\triangle PQR$ is an equilateral triangle. Find $x + y$.

A. 182°
B. 188°
C. 192°
D. 194°

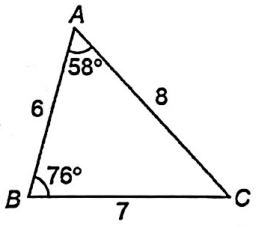


22. In the figure, $ABCD$ and $APQR$ are straight lines. Given that $AB = BP = PC = CQ$, find x.

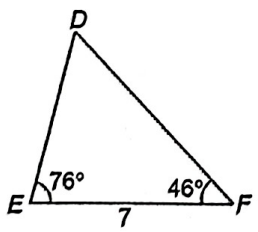
A. 69°
B. 74°
C. 79°
D 84°



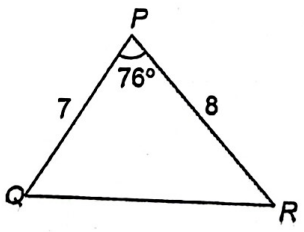
23. Which of the following triangles are congruent to ΔABC?



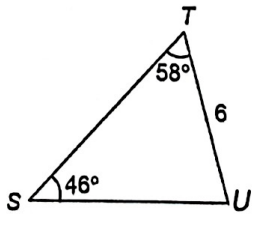
I.



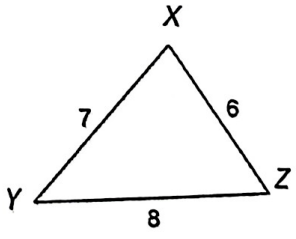
II.



III.



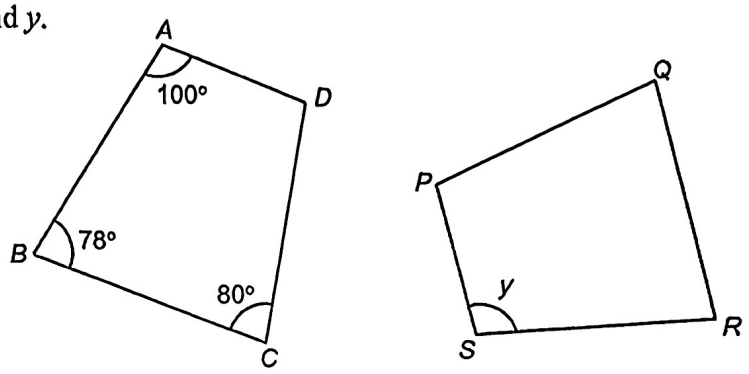
IV.



A. I and II only
B. I and III only
C. I, III and IV only
D. II, III and IV only

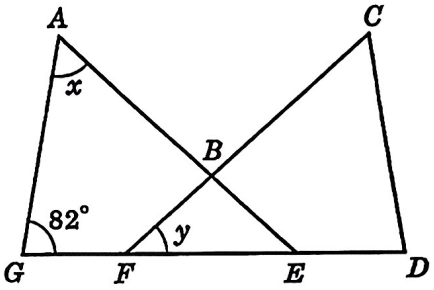
24. In the figure, $ABCD \cong PQRS$. Find y.

A. 78°
B. 80°
C. 100°
D. 102°



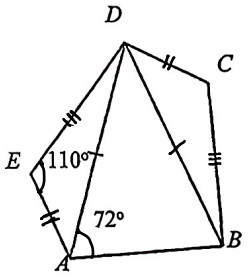
25. In the figure, $GFED$ is a straight line and $\triangle AEG \cong \triangle FCD$. Which of the following may not be correct?

A. $x = y$
B. $\angle CDF = 82°$
C. $GF = ED$
D. $AE = FC$



26. In the figure, $\triangle ABC$ is an isosceles triangle with $DA = DB$. $AE = DC$, $DE = BC$, $\angle DAB = 72°$ and $\angle AED = 110°$. Find $\angle CDE$.

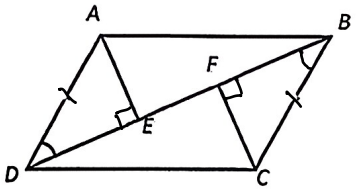
A. 106°
B. 112°
C. 142°
D. 144°



27. In the figure, $DEFB$ is a straight line. Which of the following must be true?

I. $AB \parallel DC$
II. $\angle ABD = \angle CDB$
III. $\triangle ADE \cong \triangle BCF$

A. I and II only
B. I and III only
C. II and III only
D. I, II and III



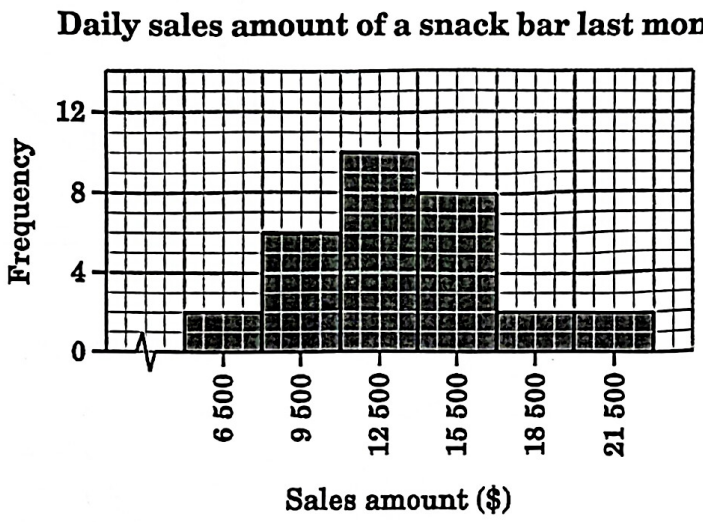
28. The table below shows the times that 60 students spend on reading every day.

Time (*min*)	21–30	31–40	41–50	51–60
Frequency	12	24	20	4

What is the class mark of the second class interval?

A. 31 min
B. 35.5 min
C. 40 min
D. 40.5 min

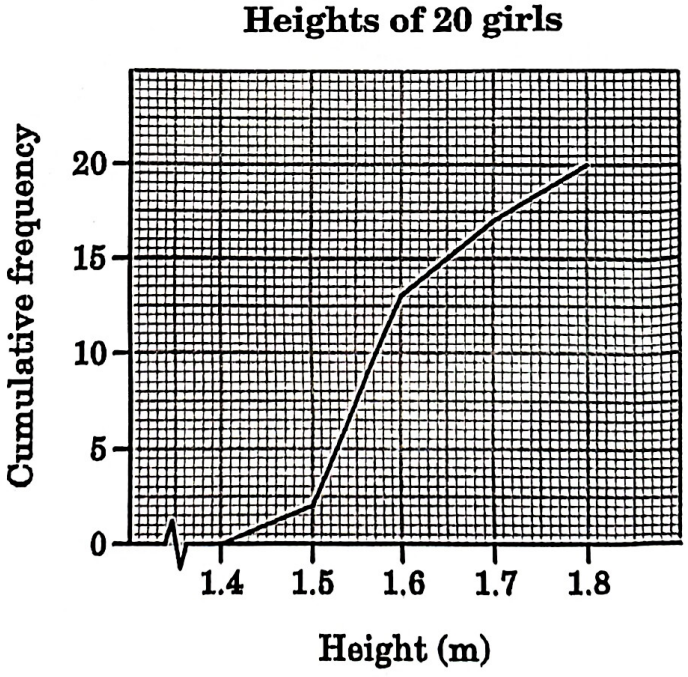
29. The histogram below shows the distribution of the daily sales amount of a snack bar last month.



How many days 00 last month?

A. 4
B. 8
C. 26
D. 27

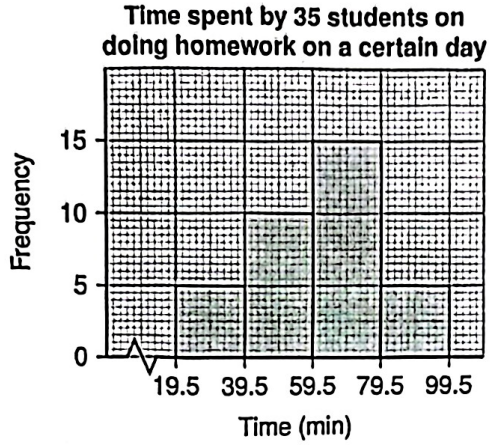
30. The cumulative frequency polygon below shows the heights of 20 girls.



How many girls are

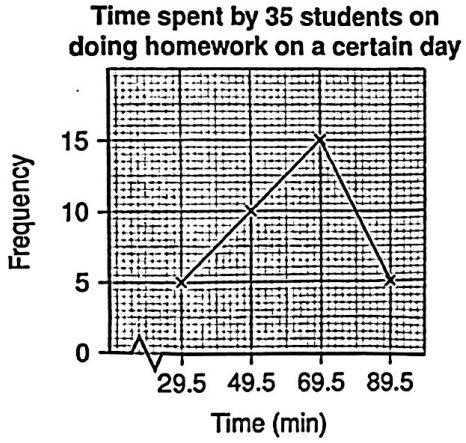
A. 3
B. 4
C. 5
D. 6

31. The histogram below shows the distribution of the time (in min) spent by 35 students on doing homework on a certain day. The first class interval is 20 min – 39 min.

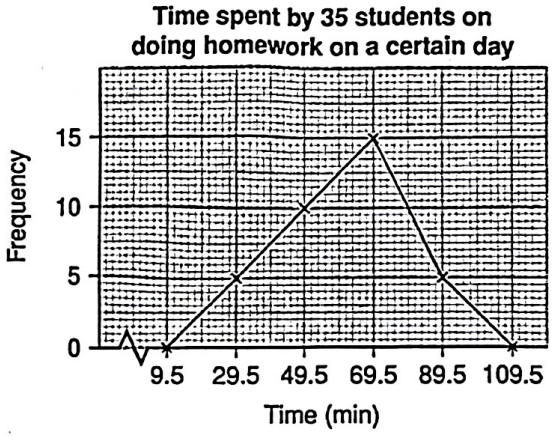


If the same set of data are presented by a frequency polygon, which of the following charts will be obtained?

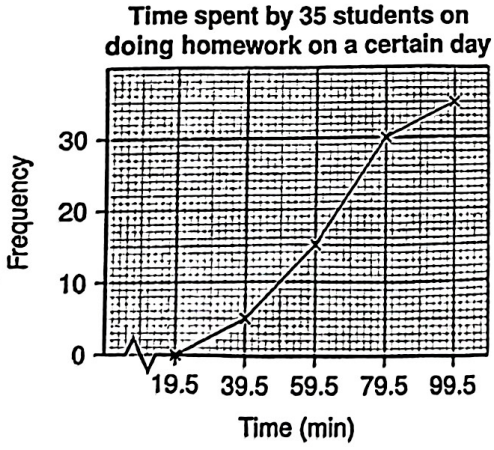
A.



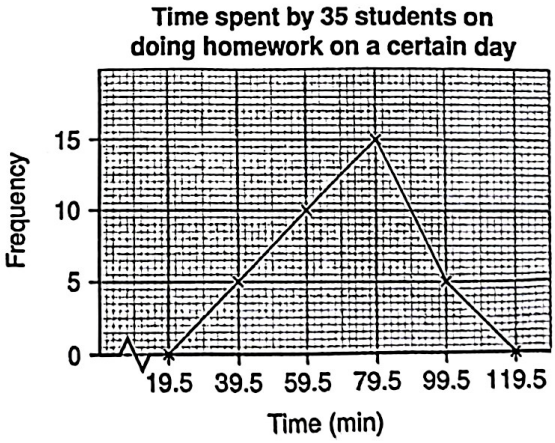
(B.)



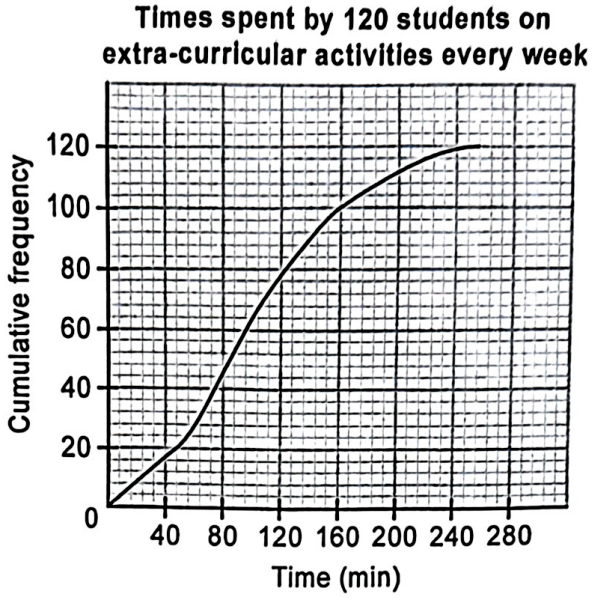
C.



D.



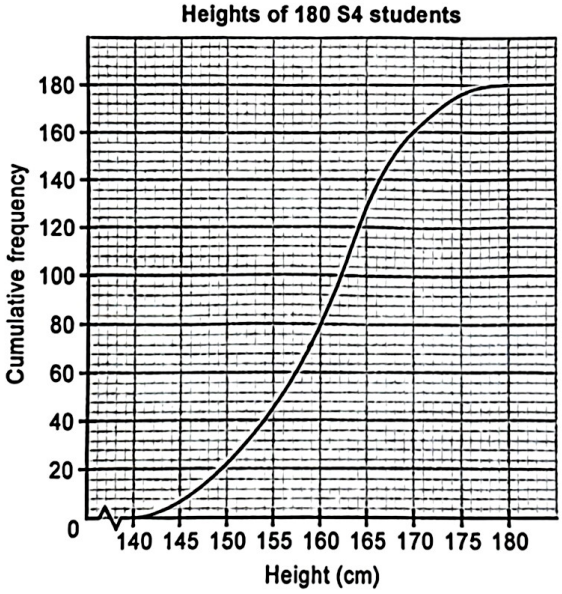
32. The following cumulative frequency curve shows the times spent by 120 students on extra- curricular activities every week.



Find 20th percentile.

A. 30 min
B. 44 min
C. 48 min
D. 56 min

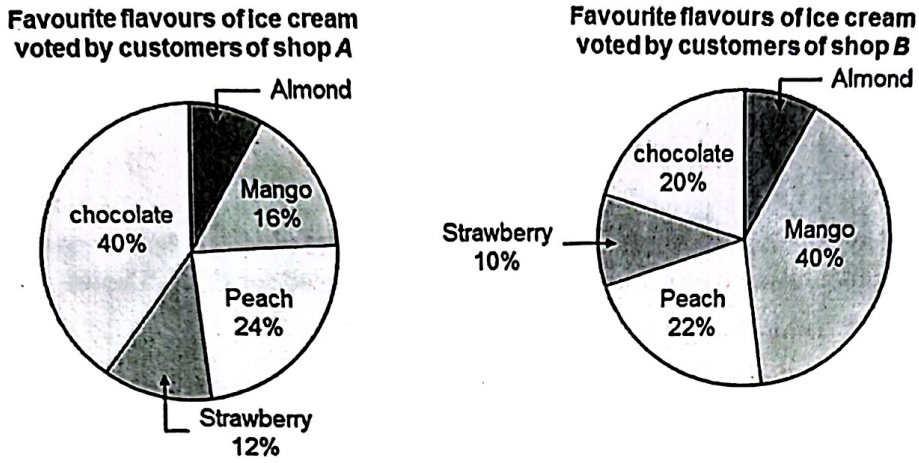
33. The following cumulative frequency curve shows the heights of 180 S4 students.



If the height of Stephy is 159 cm, find the percentile of her height in the distribution.

A. P_{40}
B. P_{48}
C. P_{60}
D. P_{72}

34. The pie charts below show the favourite flavours of ice cream voted by customers of shop A and shop B respectively.



Which of the following must be correct?

I. The number of customers of shop A who vote peach flavour is more than that of shop B.
II. In both shop A and shop B, chocolate flavour is more popular than strawberry flavour.
III. The percentages of customers who vote almond flavour in shop A and shop B are the same.

A. I only
B. III only
C. I and II only
D. II and III only

35. If $x:y=2:3$ and $z:y=3:5$, find $x:y:z$.

A. $2:3:5$
B. $9:6:10$
C. $10:15:9$
D. $15:10:6$

36. If $5x=6y=10z$, find $x:y:z$.

A. $3:5:6$
B. $5:6:10$
C. $6:5:3$
D. $18:15:10$

37. Edison, Frankie and Gary share some toy cars in the ratio of 4 : 7 : 5. If Edison gets 80 toy cars, find the total number of toy cars.

A. 140
B. 256
C 320
D. 400

38. Arrange the following speeds in ascending order:

12 m/s, 42 km/h, 690 m/min

A. 12 m/s < 42 km/h < 690 m/min
B. 690 m/min < 12 m/s < 42 km/h
C. 42 km/h < 690 m/min < 12 m/s
D. 690 m/min < 42 km/h < 12 m/s

39. Ben types for 5 hours. His average typing speeds for the first 2 hours and the last 3 hours are 45 words per minute and 30 words per minute respectively. Find his average typing speed for the 5 hours.

A. 30 words/min
B. 34 words/min
C. 35 words/min
D. 36 words/min

40. It is given that the speed of sound is 340 m/s. If Andy faces a vertical hillside and shouts, his voice bounces back and he will hear his echo after 8.5 seconds. What is the distance between Andy and the hillside?

A. 2 890 m
B. 1 445 m
C. 80 m
D. 40 m