

1. Express $0.005\ 05 \times 10^{-8}$ in scientific notation.

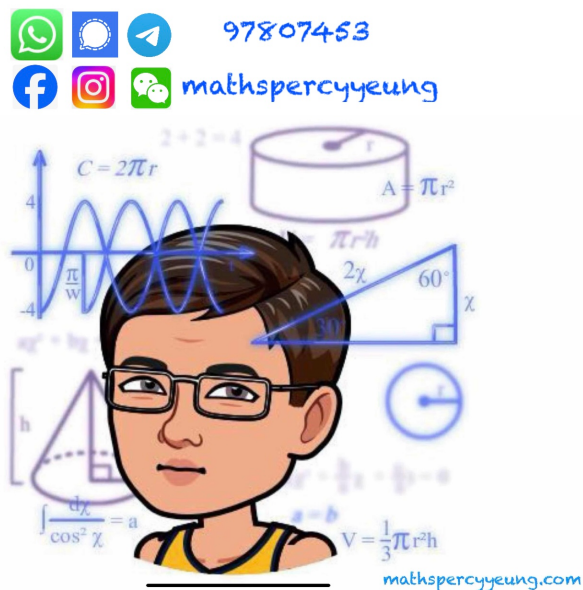
- A. 5.05×10^{-5}
- B. 5.05×10^{-6}
- C. 5.05×10^{-10}
- D. 5.05×10^{-11}

2. Convert 1101101_2 into a denary number.

- A. 77
- B. 93
- C. 109
- D. 218

3. Elise deposits \$100 000 in a bank at a simple interest rate of 5% p.a. How long does it take for Elise to receive an amount of \$200 000?

- A. 5 years
- B. 10 years
- C. 15 years
- D. 20 years



4. The present price of a photocopier is \$2551.5. If it depreciates at a constant rate of 10% per year, find the price of the photocopier 3 years ago.

- A. \$3889
- B. \$3500
- C. \$2835
- D. \$1860

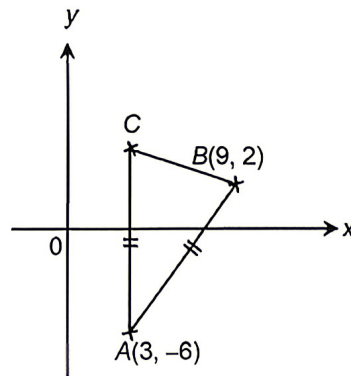
5. $4p^2 - q^2 + 10p + 5q =$

- A. $(2p - q)(2p + q - 5)$.
- B. $(2p - q)(2p + q + 5)$.
- C. $(2p + q)(2p - q - 5)$.
- D. $(2p + q)(2p - q + 5)$.

6. Given that $\cos \theta = x$, where θ is an acute angle, then $\tan \theta =$

- A. $\sqrt{1-x^2}$.
- B. $\frac{1}{\sqrt{1-x^2}}$.
- C. $\frac{x}{\sqrt{1-x^2}}$.
- D. $\frac{\sqrt{1-x^2}}{x}$.

7. The figure shows an isosceles triangle ABC , where $AB = AC$ and C is vertically above A .



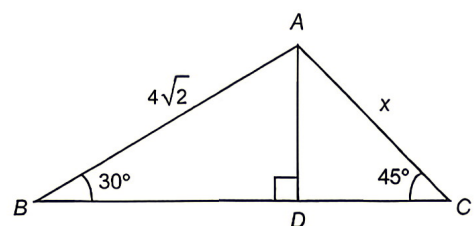
Find the coordinates of C .

- A. $(3, 4)$
 - B. $(3, 6)$
 - C. $(3, 10)$
 - D. $(2, -6)$
8. $(9, 11)$ and $B(5, 7)$ are two points on a rectangular coordinate plane. If P is a point on the y -axis such that $AP = PB$, then the coordinates of P are

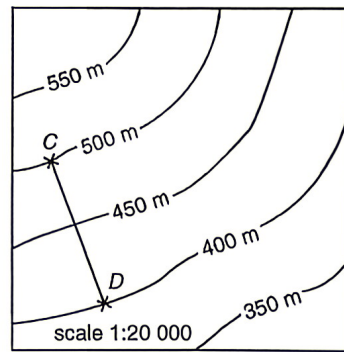
- A. $(0, -16)$.
- B. $(0, 9)$.
- C. $(0, 16)$.
- D. $(-2, 9)$.

9. In the figure, BDC is a straight line. Find the value of x .

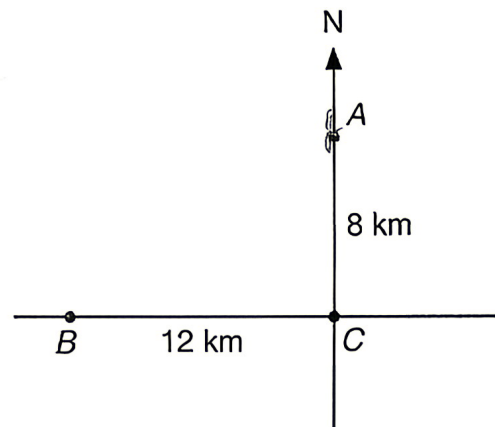
- A. $\frac{4\sqrt{6}}{3}$
- B. 4
- C. $4\sqrt{2}$
- D. $4\sqrt{3}$



10. In the figure, the contour map is drawn to the scale 1 : 20 000. A straight road CD is measured to be 2 cm on the map. Find the gradient of road CD in the form 1 : n .

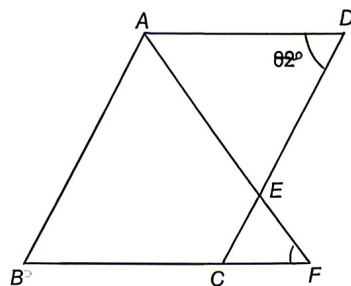


- A. 1 : 3
B. 1 : 4
C. 1 : 5
D. 1 : 6
11. In the figure, point A is 8 km due north of point C and point B is 12 km due west of point C . Find the compass bearing of B from A , correct to 3 significant figures.



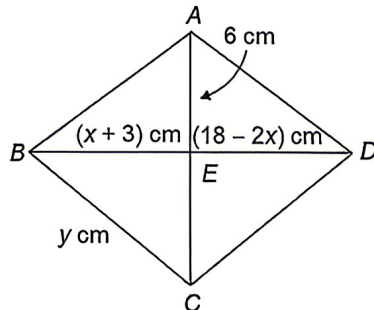
- A. S56.3°W
B. N33.7°W
C. N56.3°E
D. S33.7°W

12. In the figure, $ABCD$ is a parallelogram. BC is produced to a point F such that AF intersects CD at E and $AF = BF$. Find $\angle AFB$.



- A. 53°
- B. 56°
- C. 59°
- D. 62°

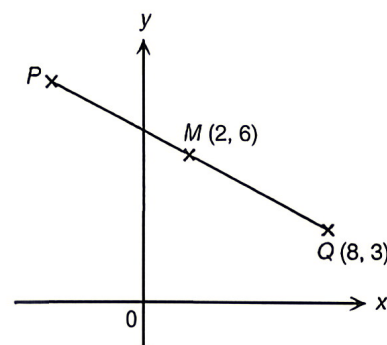
13. In the figure, $ABCD$ is a rhombus. The diagonals AC and BD intersect at E . Find the value of y .



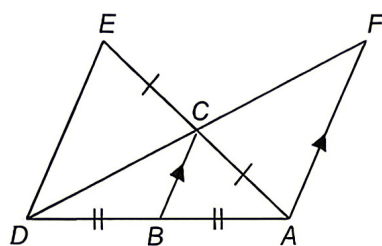
- A. 8
- B. 10
- C. 12
- D. 16

14. In the figure, $M(2, 6)$ bisects the line segment joining P and $Q(8, 3)$. Find the coordinates of P .

- A. $(-4, 9)$
- B. $(-4, 8)$
- C. $(-6, 9)$
- D. $(-6, 8)$



15. In the figure, ABD , ACE and DCF are straight lines. B and C are the mid-points of AD and AE respectively. It is given that $BC \parallel AF$. Which of the following must be true?



- I. $DC = CF$
- II. $AF \parallel DE$
- III. $\angle CDE = \angle CAF$

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

16. If $\triangle PQR$ is an obtuse-angled triangle, which of the following are true?

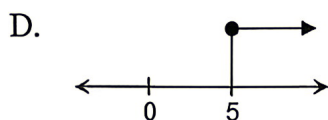
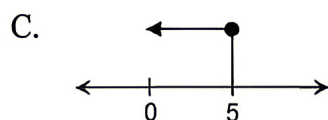
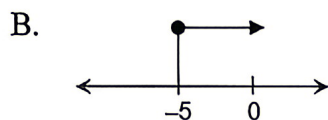
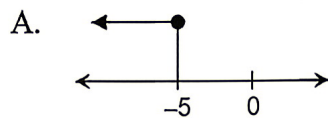
- I. The incentre of $\triangle PQR$ lies inside $\triangle PQR$.
- II. The circumcentre of $\triangle PQR$ lies inside $\triangle PQR$.
- III. The centroid of $\triangle PQR$ lies inside $\triangle PQR$.

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

17. If $r > s > 0$, which of the following is NOT true?

- A. $r + 5 > s + 5$
- B. $4 - r > 4 - s$
- C. $2r > 2s$
- D. $\frac{r}{5} > \frac{s}{5}$

18. Which of the following diagrams represents the solutions of $\frac{3x-1}{-4} \leq \frac{-2x+2}{3}$?



19. 3 times m plus 5 is greater than 40. If m is an odd number, find the smallest possible value of m .

- A. 11
- B. 12
- C. 13
- D. 14

20. The following table shows Vincent's scores in 3 levels of a game.

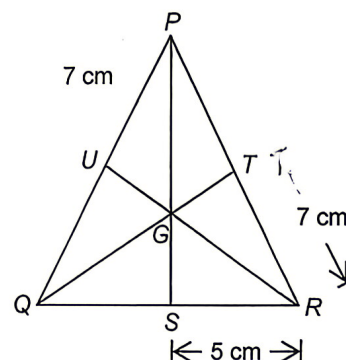
	Level 1	Level 2	Level 3
Scores	65	73	68
Weight	2	3	m

If the weighted mean score of Vincent in these 3 levels in the game is 69, find the value of m .

- A. 4
- B. 3
- C. 2
- D. 1

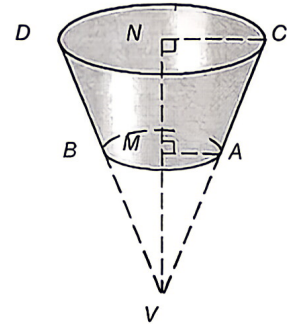
21. In the figure, G is the centroid of $\triangle PQR$. PG , QG and RG are produced to meet QR , PR and PQ at S , T and U respectively. $PU = RT = 7$ cm and $RS = 5$ cm. Find the perimeter of $\triangle PQR$.

- A. 19 cm
- B. 24 cm
- C. 33 cm
- D. 38 cm



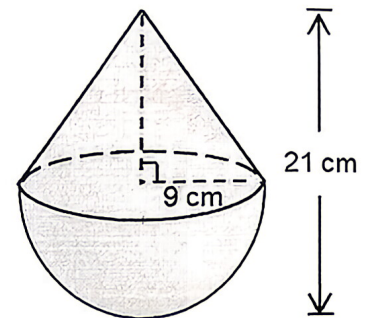
22. The figure shows a bucket in the shape of a frustum of a right circular cone. The radii of the upper base and the lower base are 8 cm and 3 cm respectively. It is given that $VM = 6$ cm and $MN = 10$ cm. Find the capacity of the bucket correct to 3 significant figures.

- A. 1020 cm^3
 B. 920 cm^3
 C. 820 cm^3
 D. 720 cm^3



23. A solid consists of a right circular cone and a hemisphere with a common base of radius 9 cm. The height of the solid is 21 cm. Find the total surface area of the solid.

- A. $270\pi \text{ cm}^2$
 B. $297\pi \text{ cm}^2$
 C. $432\pi \text{ cm}^2$
 D. $459\pi \text{ cm}^2$

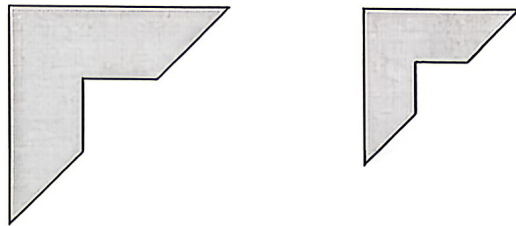


24. In the figure, 9 identical solid spheres of diameter 5 cm each are totally immersed in water in a circular cylindrical container of base diameter 18 cm. If all the spheres are removed, find the drop in water level correct to the nearest 0.1 cm.

- A. 0.6 cm
 B. 1.3 cm
 C. 2.3 cm
 D. 4.6 cm



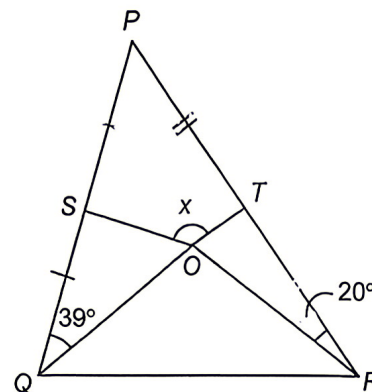
25. The figure shows a pair of similar figures. If the areas of two figures are in the ratio 25 : 9 and the perimeter of the larger figure is 50 cm, find the perimeter of the smaller figure.



- A. 12 cm
B. 18 cm
C. 24 cm
D. 30 cm
26. In a bag, there are 2 white balls, 5 black balls, 9 yellow balls and 4 orange balls. If a ball is drawn at random from the bag, find the probability that the ball is black or yellow.
- A. $\frac{1}{4}$
B. $\frac{3}{5}$
C. $\frac{7}{10}$
D. $\frac{11}{20}$
27. Consider the following set of integers.
10, 7, 6, 7, 5, 2, x , y , z
If the mean and the mode of the above data are 7 and 10 respectively, then their median is
- A. 5.
B. 6.
C. 7.
D. 8.

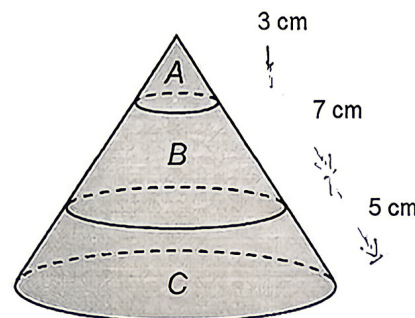
28. In the figure, O is the circumcentre of $\triangle PQR$. S and T are the mid-points of PQ and PR respectively. $\angle OQP = 39^\circ$ and $\angle ORP = 20^\circ$. Find x .

- A. 100°
 B. 111°
 C. 121°
 D. 131°



29. As shown in the figure, a right circular cone is divided into three parts A , B and C by two planes parallel to its base. Find the ratio of the volume of part A to that of part B to that of part C .

- A. $3 : 7 : 5$
 B. $27 : 343 : 125$
 C. $27 : 1000 : 3375$
 D. $27 : 973 : 2375$



30. There are 3 brands of potato chips in a supermarket. 35%, 40% and 25% of them are from Brand A , Brand B and Brand C respectively. The prices of each bag of Brand A , Brand B and Brand C potato chips are \$10, \$8 and \$15 respectively. If 6 bags of potato chips are selected at random from the supermarket, find the expected total price of the 6 bags of potato chips.

- A. \$8.9
 B. \$10.45
 C. \$62.7
 D. \$72.6