SC 4021
WASSCE (SC) 2021
GENERAL MATHEMATICS/
MATHEMATICS (CORE) 1
Objective Test
$1\frac{1}{2}$ hours

1

Name:.....

Index Number: 4332115087

THE WEST AFRICAN EXAMINATIONS COUNCIL

West African Senior School Certificate Examination (WASSCE) for School Candidates, 2021

SC 2021 GENERAL MATHEMATICS/MATHEMATICS (CORE) 1 $1\frac{1}{2}$ hours

OBJECTIVE TEST

[50 marks]

Do **not** *open this booklet until you are told to do so. While you are waiting, write your* **name** *and* **index number** *in the spaces provided at the top right-hand corner of this booklet and thereafter, read the following instructions carefully.*

1. Use **HB pencil** throughout.
2. If you have got a blank answer sheet, complete its top section as follows.
   (a) In the space marked *Name,* write in capital letters your **surname** followed by your **other names.**
   (b) In the spaces marked *Examination, Year, Subject* and *Paper,* write **'WASSCE (SC)', '2021', 'GENERAL MATHEMATICS/MATHEMATICS (CORE)'** and **'1'** respectively.
   (c) In the box marked *Index Number,* write your **index number** vertically in the spaces on the left-hand side. There are numbered spaces in line with each digit. **Shade** carefully the space with the same number as each digit.
   (d) In the box marked *Paper Code,* write the digits **402112** in the spaces on the left-hand side. **Shade** the corresponding numbered spaces in the same way as for your index number.
   (e) In the box marked *Sex,* shade the space marked **M** if you are **male,** or **F** if you are **female.**
3. If you have got a pre-printed answer sheet, check that the details are correctly printed, as described in **2** above. In the boxes marked *Index Number, Paper Code* and *Sex,* **reshade** each of the shaded spaces.
4. An example is given below. This is for a **male** candidate whose **name** is **Chinedu Oladapo DIKKO,** whose **index number** is **4251102068** and who is offering **General Mathematics/Mathematics (Core) 1.**

THE WEST AFRICAN EXAMINATIONS COUNCIL

PRINT IN BLOCK LETTERS

Name: DIKKO (Surname) CHINEDU OLADAPO (Other Names) Examination: WASSCE (SC) Year: 2021

Subject: GENERAL MATHEMATICS/MATHEMATICS (CORE) Paper: 1

INDEX NUMBER
4
2
5
1
1
0
2
0
6
8

PAPER CODE
4
0
2
1
1
2

SEX

Indicate your sex by shading the space marked M (for Male) or F (for Female) in this box: M F

For Supervisors only.
If candidate is absent shade this space: ☐

INSTRUCTIONS TO CANDIDATES

1. Use grade **HB pencil** throughout.
2. Answer each question by choosing one letter and shading it like this: [A] [B] [C]
3. Erase completely any answer(s) you wish to change.
4. Leave extra spaces blank if the answer spaces provided are more than you need.
5. Do not make any markings across the heavy black marks at the right-hand edge of your answer sheet.

02240204

Index Number:..... Do not write in this margin

Answer **all** *the questions.*

Mathematical tables may be used in any question.

The use of non-programmable, silent and cordless calculator is allowed.

Each *question is followed by* **four** *options lettered* A *to* D. *Find the correct option for* **each** *question and shade* **in pencil**, *on your answer sheet, the answer space which bears the same letter as the option you have chosen. Give only* **one** *answer to* **each** *question. An example is given below.*

The ages, in years, of **four** boys are 10, 12, 14 and 18. What is the average age of the boys?

A. 12 years

B. $12\frac{1}{2}$ years

C. 13 years

D. $13\frac{1}{2}$ years

The correct answer is $13\frac{1}{2}$ years, *which is lettered* D, *and therefore answer space* D *would be shaded.*

[A] [B] [C] [D]

Think carefully before you shade the answer spaces; erase completely **any** *answer you wish to change.*

Do **all** *rough work on this question paper.*

Now, answer the following questions.

1. Correct, 0.00798516 to **three** significant figures.

A. 0.0109
B. 0.0800
C. 0.00799
D. 0.008

0.00799

2. Simplify: $(11_{two})^2$.

A. 1001_{two}
B. 1101_{two}
C. 101_{two}
D. 10001_{two}

$$\begin{array}{r} 11 \\ \times\ 11 \\ \hline 11 \\ +11 \\ \hline 1001 \end{array}$$

3. Solve: $2^{\sqrt{2x+1}} = 32$.

A. 13
B. 24
C. 12
D. 11

$2^{\sqrt{2x+1}} = 32$

$2^{(2x+1)^{1/2}}$

$\Rightarrow (2x+1)^{1/2} = 2^5 = 5$

multiply both powers by 2

$(2x+1)^{\frac{1}{2}\times 2} = 5^{1\times 2}$

$(2x+1)^{\frac{2}{2}} = 5^2$

$\Rightarrow 2x+1 = 25$

$\Rightarrow 2x = 24 ; \Rightarrow x = 12$

4. If $\log_{10}2 = m$ and $\log_{10}3 = n$, find $\log_{10}24$ in terms of m and n.

A. $3m+n$
B. $m+3n$
C. $4mn$
D. $3mn$

$\log_{10}24$

$\log_{10}(4\times 6)$

$\log_{10}4 + \log_{10}6$

$\Rightarrow \log_{10}2^2 + \log_{10}(3\times 2)$

$2\log_{10}2 + \log_{10}3 + \log_{10}2$

$\Rightarrow 2m+n+m$

$\Rightarrow 3m+n$

5. Find the 5^{th} term of the sequence: 2, 5, 10, 17, ...

A. 22
B. 24
C. 36
D. 26

The formula for the nth term is given by n^2+1

$\Rightarrow$ 5th term; $n^2+1 = 5^2+1$

$= 26$

6. If $P = \{-3 < x < 1\}$ and $Q = \{-1 < x < 3\}$, where x is a real number, find $P \cap Q$.

A. $\{-1 < x < 1\}$
B. $\{-3 \le x \le 1\}$
C. $\{-3 < x < 1\}$
D. $\{-1 \le x \le 1\}$

$P = \{x: -2, -1, 0\}$

$Q = \{x: 0, 1, 2\}$

$\Rightarrow P \cap Q = \{0\}$

$\Rightarrow P \cap Q = \{-1 < x < 1\}$

Do not write in this margin

Index Number:.....

7. Factorize $6pq - 3rs - 3ps + 6qr$.

A. $3(r-p)(2q+s)$ 6pq-3rs-3ps+6qr
B. $3(p+r)(2q-s)$ 6pq+6qr-3rs-3ps
C. $3(p-r)(2q-s)$ 6q(p+r)-3s(r+p)
D. $3(r-p)(s-2q)$ (6q-3s)(p+r)
3(2q-s)(p+r)

8. What number should be subtracted from the sum of $2\frac{1}{6}$ and $2\frac{7}{12}$ to give $3\frac{1}{4}$?

A. $\frac{1}{3}$ Let the number be x then,
B. $1\frac{1}{2}$ $\left(\frac{13}{6}+\frac{31}{12}\right)-x=\frac{13}{4}$
C. $1\frac{1}{6}$ $\frac{13}{6}+\frac{31}{12}-\frac{x}{1}=\frac{13}{4}$
$\frac{26+31-12x}{12}=39$
D. $\frac{1}{2}$ $\Rightarrow 57-12x=39$
$\Rightarrow 12x=18;\ \Rightarrow x=3/2$

9. Mensah is 5 years old and Joyce is **thrice** as old as Mensah. In how many years will Joyce be **twice** as old as Mensah?

Mensah = 5 years
A. 3 years Joyce = 3×5 = 15 years.
B. 10 years Let the years be x.
C. 5 years $\Rightarrow 15+x=2(5+x)$
D. 15 years $\Rightarrow 15-10=2x-x;\ x=5$

10. If $16\times 2^{(x+1)}=4^x\times 8^{(1-x)}$, find the value of x.

$16\times 2^{(x+1)}=4^x\times 8^{(1-x)}$
A. −4 $2^4\times 2^{(x+1)}=2^{2x}\times 2^{3(1-x)}$
B. 4 $\Rightarrow 2^{4+(x+1)}=2^{2x+3-3x}$
C. 1 $\Rightarrow 2^{5+x}=2^{3-x}$
D. −1 $\Rightarrow 5+x=3-x;\ x=-1$

11. The circumference of a circular track is 9 *km*. A cyclist rides round it a number of times and stops after covering a distance of 302 *km*. How far is the cyclist from the starting point?

The number of times the cyclist rides round it is given by
A. 5 km $\frac{302\text{ km}}{9\text{ km}}=33.56$
B. 6 km ≈ 33 times
C. 7 km
D. 3 km $\Rightarrow 33\times 9=297$
$\Rightarrow$ distance from starting point is $302-297=5$ km

12. Simplify. $2\sqrt{7}-\frac{14}{\sqrt{7}}+\frac{7}{\sqrt{21}}$.

A. $\frac{\sqrt{21}}{21}$ $2\sqrt{7}-\frac{14\sqrt{7}}{\sqrt{7}\times\sqrt{7}}+\frac{7\sqrt{21}}{\sqrt{21}\times\sqrt{21}}$
B. $\frac{7\sqrt{21}}{3}$ $2\sqrt{7}-\frac{14\sqrt{7}}{7}+\frac{7\sqrt{21}}{21}$
C. $\frac{\sqrt{21}}{3}$ $2\sqrt{7}-2\sqrt{7}+\frac{\sqrt{21}}{3}=\frac{\sqrt{21}}{3}$
D. $3\sqrt{21}$

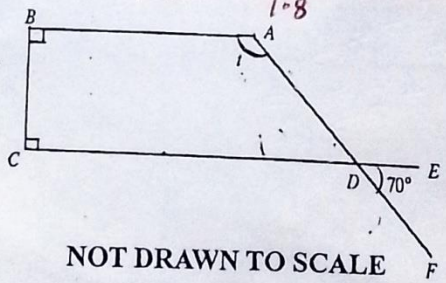
13. If $4x+2y=16$ and $6x-2y=4$, find the value of $(y-x)$.

$4x+2y=16$ ---(i)
A. 8 $6x-2y=4$ ---(ii)
B. 2 (i)+(ii) $10x=20;\ x=2$
C. 4 from (i) $4(2)+2y=16;\ y=4$
D. 6 $\Rightarrow y-x=4-2=2$

14. Given that R is directly proportional to L and inversely proportional to P, $R=3$ when $L=9$ and $P=0.8$, find R when $L=15$ and $P=1.8$.

$R\propto L\frac{1}{P}\Rightarrow R=\frac{kL}{P}$
A. 2.2 $\Rightarrow 3=\frac{9k}{0.8};\ 2.4=9k$
B. 3.3
C. 6.6 $\Rightarrow k=0.267$
D. 0.3 $\Rightarrow R=\frac{0.3\times 15}{1.8}=2.2$

15.



NOT DRAWN TO SCALE

In the diagram, $\angle ABC$ and $\angle BCD$ are right angles, $\angle BAD = t$ and $\angle EDF = 70°$. Find the value of t.

From the diagram,
A. 70° $\angle ADC=70°$ (vertically opp. angles)
B. 165° Similarly,
C. 140° $\angle ADE=\angle CDF=\frac{1}{2}(360-140)$
D. 110° (Angles at a point)
$\Rightarrow \angle ADE=\angle CDF=\frac{1}{2}(220)=110°$
$\Rightarrow D=110°$, but $D=t=$ corresponding angles
$\Rightarrow t=110°$

Index Number:.....

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16. The sum of the interior angles of a regular polygon with k sides is $(3k-10)$ right angles. Find the size of the exterior angle.

The interior angles of any Polygon with n sides is $(n-2)180$

A. 60°
B. 40°
C. 90°
D. 120°

$\Rightarrow (3k-10)90 = (k-2)180$
$\Rightarrow 3k-10 = 2k-4$
$\Rightarrow 3k-2k = 10-4$
$\Rightarrow k=6;$ Ext. angle $= \frac{360}{6} = 60$

17. Make U the subject of the relation:

$x = \frac{2U-3}{3U+2}$.

$x(3u+2) = 2u-3$
$3ux+2x = 2u-3$
$3ux-2u = -3-2x$
$u(3x-2) = -3-2x$
$\Rightarrow u(3x-2) = -(3+2x)$
$u = \frac{-(3+2x)}{(3x-2)}$
$u = \frac{(2x+3)}{(2-3x)}$

A. $U = \frac{2x+3}{3x-2}$
B. $U = \frac{2x-3}{3x-2}$
C. $U = \frac{2x+3}{2-3x}$
D. $U = \frac{2x+3}{3x+2}$

18. A trader paid import duty of 38 kobo in the naira on the cost of an engine. If a total of ₦22,800.00 was paid as import duty, calculate the cost of the engine.

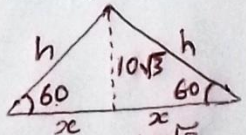
Import duty is Calculated as 1% total cost.
Let total cost be x
$\Rightarrow x = 100\%$
₦22,800 = 1%

A. ₦60,000.00
B. ₦120,000.00
C. ₦24,000.00
D. ₦18,000.00

$\Rightarrow x = \frac{100\% \times 22800}{1\%} = ₦2,280,000$

(18)
Let the cost of an engine be y.
Then
$y = 100\%$
₦0.38 = 1%
$\Rightarrow y = 100\% \times \frac{₦0.38}{1\%}$
$\Rightarrow y = ₦38$
$\Rightarrow$ Cost per engine $= \frac{2,280,000}{38}$
$= ₦60,000$

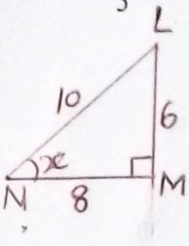
19. The height of an equilateral triangle is $10\sqrt{3}$ cm. Calculate its perimeter.



A. 20 cm
B. 60 cm
C. 40 cm
D. 30 cm

$\sin 60 = \frac{10\sqrt{3}}{h}$
but $\sin 60 = \frac{\sqrt{3}}{2}$
$\Rightarrow \frac{\sqrt{3}}{2} = \frac{10\sqrt{3}}{h}$
$\Rightarrow h = \frac{2 \times 10\sqrt{3}}{\sqrt{3}}$
$\Rightarrow h = 20$
Similarly
$\tan 60 = \frac{10\sqrt{3}}{x}$
but $\tan 60° = \sqrt{3}$
$\Rightarrow \sqrt{3} = \frac{10\sqrt{3}}{x}$
$\Rightarrow x = \frac{10\sqrt{3}}{\sqrt{3}}$
$\Rightarrow x = 10$
$\Rightarrow$ Perimeter is
$20+20+10+10$
$= 60cm$

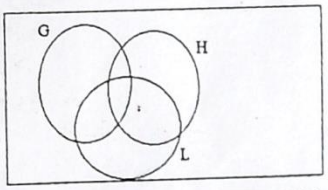
20. In ΔLMN, $|\overline{LM}| = 6$ cm, $\angle LMN = 90°$, $\angle LNM = x$ and $\sin x = \frac{3}{5}$. Find the area of ΔLMN.

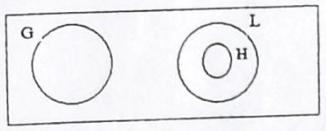


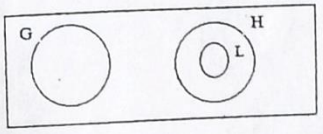
A. 60 cm^2
B. 48 cm^2
C. 24 cm^2
D. 30 cm^2

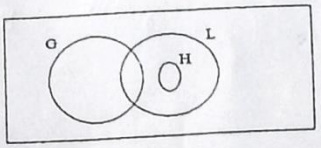
$|LM| = 6$
$\sin x = \frac{|LM|}{|LN|} = \frac{3}{5} = \frac{6}{10}$
$\Rightarrow |LN| = 10$
$\Rightarrow |NM| = \sqrt{100-36}$
$= 8$
$\Rightarrow$ Area of ΔLMN is
$\frac{1}{2}hb = \frac{1}{2} \times 6 \times 8$
$= 24cm^2$

21. Consider the statements:
P: All students offering Literature(L) also offer History(H);
Q: Students offering History(H) do **not** offer Geography(G).
Which of the venn diagrams **correctly** illustrate the two statements?

A.


B.


C.


D.


22. Find the quadratic equation whose roots are $-2q$ and $5q$.

$x = -2q, x = 5q$
$\Rightarrow x+2q = 0, x-5q = 0$

A. $x^2 + 3qx - 10q^2 = 0$
B. $x^2 + 3qx + 10q^2 = 0$
C. $x^2 - 3qx + 10q^2 = 0$
D. $x^2 - 3qx - 10q^2 = 0$

$\Rightarrow (x+2q)(x-5q) = 0$
$\Rightarrow x^2 - 5xq + 2xq - 10q^2$
$\Rightarrow x^2 - 3xq - 10q^2 = 0$

Alternatively:
Using the formula $x^2 - (\alpha+\beta)x + \alpha\beta = 0$
$\Rightarrow x^2 - (-2q+5q)x + (-2q \times 5q)$
$\Rightarrow x^2 - 3qx + (-10q^2) = 0$
$\Rightarrow x^2 - 3qx - 10q^2 = 0$

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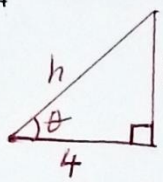
Index Number:.....

23. If $\tan\theta = \frac{3}{4}$, $180° < \theta < 270°$, find the value of $\cos\theta$.



The right-angled triangle for $\tan\theta = \frac{3}{4}$

A. $\frac{4}{5}$

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

C. $-\frac{4}{5}$

D. $-\frac{3}{5}$

$\Rightarrow h^2 = 4^2 + 3^2$; $h = \sqrt{16+9}$

$\Rightarrow h = 5$

$\Rightarrow \cos\theta = \frac{4}{5}\left(\frac{adj}{hyp}\right)$

But cos is − for θ lie in 3rd quadrant, for $180° < \theta < 270°$ $\Rightarrow \cos\theta = -\frac{4}{5}$

24. If $\frac{2}{(x-3)} - \frac{3}{(x-2)} = \frac{p}{(x-3)(x-2)}$, find p.

A. $(5-x)$

B. $-(x+5)$

C. $(13-x)$

D. $-(5x-13)$

$\frac{2}{(x-3)} - \frac{3}{(x-2)} = \frac{P}{(x-3)(x-2)}$

$\frac{2(x-2)-3(x-3) = P}{(x-3)(x-2)}$

$\Rightarrow P = 2x-4-3x+9$

25. The diagonals of a rhombus are 12 *cm* and 5 *cm*. Calculate its perimeter.

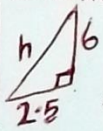
A. 26 *cm*

B. 24 *cm*

C. 17 *cm*

D. 34 *cm*

From each right-angle triangle of the Rhombus we have;

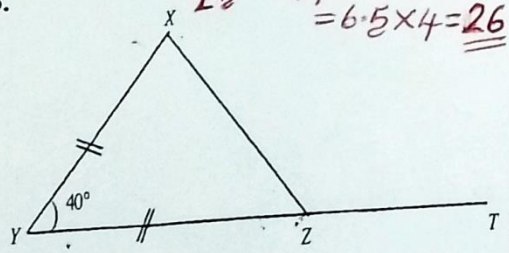


$\Rightarrow h = \sqrt{36+6.25}$

$\Rightarrow h = 6.5\,cm$

$\Rightarrow$ perimeter $= 6.5 \times 4 = 26$

26.



NOT DRAWN TO SCALE

In the diagram, ΔXYZ is produced to T. If $|\overline{XY}| = |\overline{ZY}|$ and $\angle XYT = 40°$, find $\angle XZT$.

A. 110°

B. 130°

C. 120°

D. 140°

ΔXYZ is an Isosceles triangle. Thus,

$\angle YXZ = \angle XZY = \frac{1}{2}(180-40)$

$= \frac{1}{2}(140)$

$= 70°$

$\Rightarrow XZT = 180 - 70$

$= 110°$

27. A solid brass cube is melted and recast as a solid cone of height h and base radius r. If the height of the cube is h, find r in terms of h.

A. $r = h$

B. $r = \sqrt{\frac{3h}{\pi}}$

C. $r = \pi h$

D. $r = h\sqrt{\frac{3}{\pi}}$

height of Cube $= h$

$\Rightarrow$ Volume of Cube $= h^3$

Volume of Cone $= \frac{1}{3}\pi r^2 h$

equating Volume of Cube = Volume of Cone

$\Rightarrow h^3 = \frac{1}{3}\pi r^2 h$; $3h^3 = \pi r^2 h$

$\Rightarrow r^2 = \frac{3h^3}{\pi h}$; $r^2 = \frac{3h^2}{\pi}$; $r = \sqrt{\frac{3h^2}{\pi}}$

$\Rightarrow r = h\sqrt{\frac{3}{\pi}}$

28. Which of the following is **not** an exterior angle of a regular polygon?

A. 66°

B. 72°

C. 24°

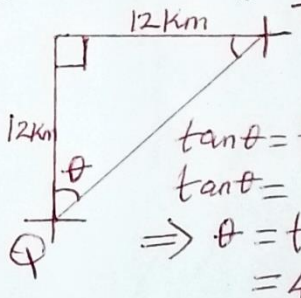
D. 15°

Exterior angles of regular polygon are all equal and are factors of 360°.

66° is not a factor of 360°

$\Rightarrow$ 66° is not an exterior angle of a regular polygon.

29. From a point T, a man moves 12 *km* due West and then moves 12 *km* due South to another point Q. Calculate the bearing of T from Q.



A. 225°

B. 315°

C. 045°

D. 135°

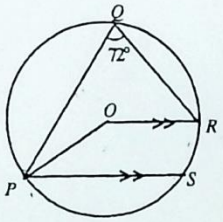
$\tan\theta = \frac{12}{12}$

$\tan\theta = 1$

$\Rightarrow \theta = \tan^{-1}1$

$= 45°$

30.



NOT DRAWN TO SCALE

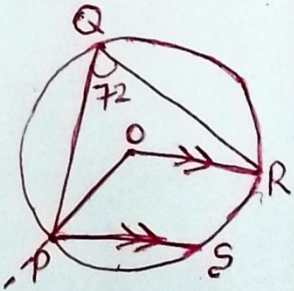
In the diagram, O is the centre of circle $PQRS$, $\angle PQR = 72°$ and $\overline{OR} // \overline{PS}$. Find $\angle OPS$.

A. 18°

B. 108°

C. 54°

D. 36°



$\angle ROP = 72 \times 2$ (angle @ cent. twice circ.)

$= 144°$

$\angle SPT = 144°$ (Corresponding angles)

$\Rightarrow \angle OPS = 180 - 144$ (straight line angles)

$= 36°$

Index Number:.....

31. A trapezium of sides 10 *cm* and 21 *cm* and height 8 *cm* is inscribed in a circle of radius 7 *cm*. Calculate the area of the region **not** covered by the trapezium.

[Take $\pi = \frac{22}{7}$]

A. 84 cm^2
B. 80 cm^2
C. 30 cm^2
D. 94 cm^2

Area of circ. $\pi r^2 = 3.143 \times 7^2 = 153.9\ cm^2$

Area of trapezium $\frac{1}{2}h(s+s) = \frac{1}{2} \times 8(10+21) = 124\ cm^2$

$\Rightarrow$ Area not covered $= 153.9 - 124 = 30$

32. Find, correct to **two** decimal places, the mean of $1\frac{1}{2}$, $2\frac{2}{3}$, $3\frac{3}{4}$, $4\frac{4}{5}$ and $5\frac{5}{6}$.

A. 3.71
B. 3.70
C. 3.69
D. 3.72

$\frac{3}{2}, \frac{8}{3}, \frac{15}{4}, \frac{24}{5}$ and $\frac{35}{6}$

$\Rightarrow \bar{x} = \frac{1113}{\frac{60}{5}}$; $\frac{1113}{300}$

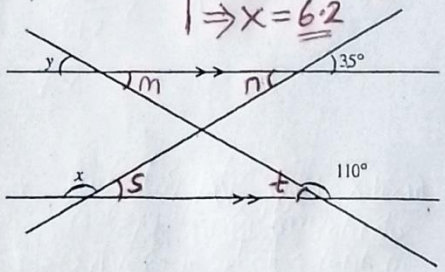
$\Rightarrow \bar{x} = 3.71$

33. A cyclist moved at a speed of X *km/h* for 2 *hours*. He then increased his speed by 2 *km/h* for the next 3 *hours*. If the total distance covered is 36 *km*, calculate his initial speed, X.

A. 12 *km/h*
B. 3 *km/h*
C. 4 *km/h*
D. 6 *km/h*

Initial speed $= X$
final speed $= X + 2$
Ave. speed $= X + (X+2)$
Ave. speed $= \frac{\text{total dist.}}{\text{total time}}$
$\frac{X + (X+2)}{2} = \frac{36}{5}$
$\Rightarrow X = 6.2$

34.



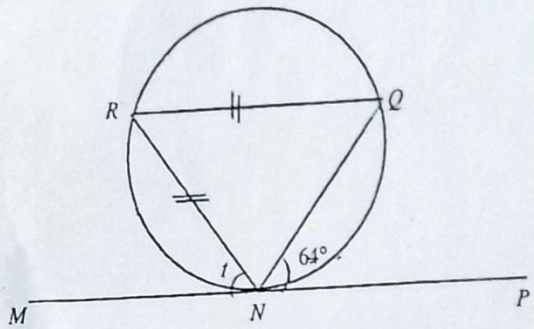
NOT DRAWN TO SCALE

Find the value of $(x + y)$ in the diagram.

A. 215°
B. 70°
C. 135°
D. 145°

Adding m, n, s and t to the diagram
$t = 180° - 110°$ (straight $\angle$s)
$= 70°$
$m = 70°$ (alternate $\angle$s)
$\Rightarrow y = 70°$ (opp. $\angle$s)
$n = 35°$ (opp $\angle$s)
$\Rightarrow s = 35°$ (alt. $\angle$s)
$\Rightarrow x = 180° - 35° = 145°$
$\Rightarrow x + y = 145 + 70 = 215°$

35.



NOT DRAWN TO SCALE

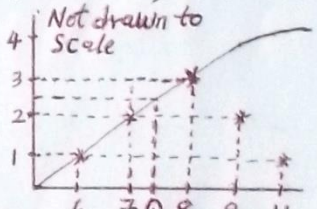
In the diagram, $\overline{MP}$ is a tangent to the circle NQR, $\angle PNQ = 64°$ and $|\overline{RQ}| = |\overline{RN}|$. Find the angle marked t.

A. 130°
B. 115°
C. 58°
D. 64°

Triangle RQN is Isosceles
Thus $\angle RNQ = \angle RQN$
$\angle NRQ = 64°$ (ext. $\angle$ equal to opp. interior)
$\Rightarrow \angle RNQ = \angle RQN = \frac{1}{2}(180 - 64)$
$\Rightarrow t = \frac{1}{2}(116) = 58$

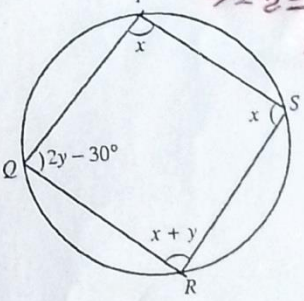
36. Find the first quartile of 7, 8, 7, 9, 11, 8, 7, 9, 6 and 8.

A. 8.5
B. 7.0
C. 7.5
D. 8.0



$Q_1 = \frac{1}{4} \times 10 = 2.5$
$\Rightarrow 2.5 = 7.5$

37.



NOT DRAWN TO SCALE

In the diagram, $PQRS$ is a circle. Find the value of x.

A. 50°
B. 30°
C. 80°
D. 100°

Interior angle of Quard. Sum up to 360°
$\Rightarrow (2y - 30) + x + x + (x + y) = 360°$
$\Rightarrow 3x + 3y = 390°$ (i)
Similarly, opp angles of Quard. are supplementary
$\Rightarrow (x + y) + x = 180°$
$2x + y = 180°$ (ii)
$\Rightarrow y = 180° - 2x$
$\Rightarrow y$ in equation (i)
$3x + 3(180 - 2x) = 390°$
$\Rightarrow x = 50°$

Index Number:.....

38. A cone has a base radius of 8 *cm* and height 11 *cm*. Calculate, correct to **two** decimal places, the curved surface area.
[Take $\pi = \frac{22}{7}$]

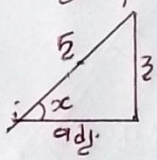
A. 341.98 cm^2
B. 276.57 cm^2
C. 201.14 cm^2
D. 477.71 cm^2

Curved surface area of a cone $= \pi rl$
$l^2 = r^2 + h^2 = 8^2 + 11^2$
$\Rightarrow l = \sqrt{185} = 13.6$
$\Rightarrow r\pi l = \frac{22}{7} \times 8 \times 13.6$
$= 341.97 cm^2$

39. Given that $\sin x = \frac{3}{5}, 0^\circ \leq x \leq 90^\circ$, evaluate $(\tan x + 2\cos x)$.

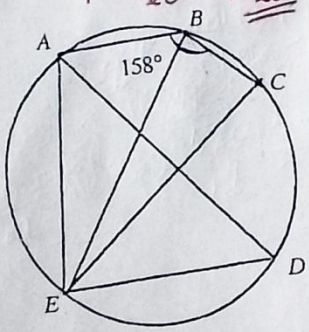
A. $2\frac{11}{20}$
B. $2\frac{7}{20}$
C. $\frac{11}{20}$
D. $\frac{1}{20}$

the right-angled triangle for $\sin x = \frac{3}{5}$ is,



$\Rightarrow adj = 4$
$\tan x = \frac{3}{4}$
$\cos x = \frac{4}{5}$
$\Rightarrow (\tan x + 2\cos x)$
$= \frac{3}{4} + 2\left(\frac{4}{5}\right); \frac{3}{4} + \frac{8}{5}$
$\Rightarrow \frac{47}{20} = 2\frac{7}{20}$

40.

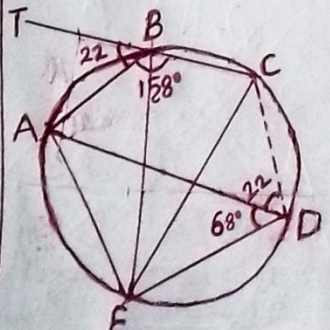


NOT DRAWN TO SCALE

In the diagram, $\overline{EC}$ is a diameter of the circle *ABCDE*. If $\angle ABC = 158^\circ$, find $\angle ADE$.

A. 112°
B. 90°
C. 68°
D. 22°

producing T from B



$\angle ABT = 180 - 158$ (straight line)
$= 22^\circ$
$\Rightarrow \angle ABT = \angle ADC = 22^\circ$ (ext. Qud.)
ΔCDE = Right-angled triangle ($\angle$ in semi circle)
$\Rightarrow \angle ADE = 90^\circ - 22^\circ = 68^\circ$

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41.

Height (cm)	160	161	162	163	164	165
No. of players	4	6	3	7	8	9

The table shows the heights of thirty-seven players of a basketball team. Calculate, correct to **one** decimal place, the mean height of the players.

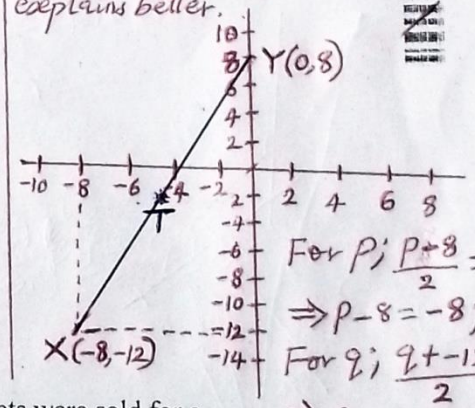
A. 163.0
B. 162.0
C. 160.0
D. 165.0

Mean $\bar{x} = \frac{\sum fx}{\sum f}$
$\sum fx = (160 \times 4) + (161 \times 6) + (162 \times 3) + (164 \times 8) + (163 + 7) + (165 \times 9)$
$= 6030$
$\sum f = 37$
$\Rightarrow \bar{x} = \frac{6030}{37} = 162.9 \approx 163$

42. $\overline{XY}$ is a line segment with the coordinates $X(-8, -12)$ and $Y(p, q)$. If the midpoint of $\overline{XY}$ is $(-4, -2)$, find the coordinates of *Y*.

A. $(-6, -10)$
B. $(0, 8)$
C. $(4, 10)$
D. $(0, 4)$

A sketch of the problem explains better.



For p; $\frac{p+8}{2} = -4$
$\Rightarrow p - 8 = -8; p = 0$
For q; $\frac{q+-12}{2} = -2$
$\Rightarrow q - 12 = -4; q = 8$
$\Rightarrow Y(p, q) = (0, 8)$
$\Rightarrow$ Midpoint $T = (-4, -2)$

43. Five hundred tickets were sold for a concert. Tickets for adults and children were sold at $ 4.50 and $ 3.00 respectively. If the total receipts for the concert was $ 1,987.50, how many tickets for adults were sold?

A. 325
B. 235
C. 175
D. 400

Let the total number of adult and children who bought tickets be x and y respectively. Then
$4.5x + 3y = 1987.5$ ... (i)
$x + y = 500$ ..... (ii)
$\Rightarrow y = 500 - x$; Subs. y in (i)
$4.5x + 3(500 - x) = 1987.5$
$4.5x + 1500 - 3x = 1987.5$
$\Rightarrow 1.5x = 487.5; \Rightarrow x = \frac{487.5}{1.5}$
$= 325$

Index Number:.....

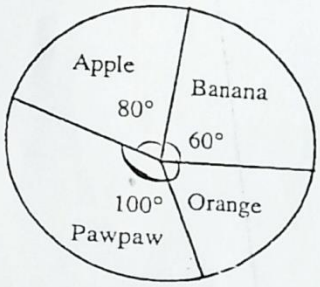
Do not write in this margin

44. The distance (d) between two villages is more than 18 km but **not** more than 23 km. Which of these inequalities represents the statement?

A. $18 \leq d \leq 23$
B. $18 < d < 23$
C. $18 \leq d < 23$
D. $18 < d \leq 23$

$18 < d < 23$

45.



NOT DRAWN TO SCALE

The pie chart represents the distribution of fruits on display in a shop. If there are 60 apples on display, how many oranges are there?

A. 80
B. 270
C. 120
D. 90

$x \rightarrow 360°$
$60 \rightarrow 80°$; $x = \frac{60 \times 360}{80} = 270°$
Sector of orange $360 - 240 = 120°$
$270 \rightarrow 360°$
$120 \rightarrow$ orange; $\Rightarrow$ orange $= 90$

46. A box contains 40 identical balls of which 10 are red and 12 are blue. If a ball is selected at random from the box, what is the probability that it is **neither** red **nor** blue?

A. $\frac{9}{20}$
B. $\frac{3}{10}$
C. $\frac{1}{4}$
D. $\frac{11}{20}$

$40 - (10 + 12) = 18$
$\Rightarrow P(R+B)' = \frac{18}{40} = \frac{9}{20}$

47. A fair die is tossed twice. What is the probability of getting a sum of **at least** 10?

A. $\frac{5}{36}$
B. $\frac{2}{3}$
C. $\frac{5}{18}$
D. $\frac{1}{6}$

	1	2	3	4	5	6
1	11	12	13	14	15	16
2	21	22	23	24	25	26
3	31	32	33	34	35	36
4	41	42	43	44	45	46
5	51	52	53	54	55	56
6	61	62	63	64	65	66

A Sum of at least $10 = \frac{6}{36} = \frac{1}{6}$

48. A man will be $(x + 10)$ years old in 8 years time. If 2 years ago, he was 63 years, find the value of x.

A. 55
B. 63
C. 57
D. 67

Let the man's age be y. Then,
$y + 8 = (x + 10)$
$y + 8 = x + 10$
$y - x = 2$ (i)
Also, $y - 2 = 63$
$\Rightarrow y = 65$
Substituting y in (i)
$65 - x = 2$
$\Rightarrow x = 65 - 2 = 63$

49. The equation of a line is given as $3x - 5y = 7$. Find its gradient (slope).

A. $\frac{5}{3}$
B. $\frac{3}{5}$
C. $-\frac{3}{5}$
D. $-\frac{5}{3}$

$3x - 5y = 7$
$\Rightarrow 5y = 3x - 7$
$\Rightarrow y = \frac{3}{5}x - \frac{7}{5}$
Comparing with the equation $y = mx + c$,
$\Rightarrow$ Gradient $m = \frac{3}{5}$

50. For what value of x is $\frac{4-2x}{x+1}$ undefined?

A. 2
B. −1
C. 1
D. −2

The fraction is undefined when $x + 1 = 0$.
$\Rightarrow x + 1 = 0$
$\Rightarrow x = 0 - 1$
$\Rightarrow x = -1$

EXAMINATION MALPRACTICE IS CORRUPTION.
DO NOT PARTICIPATE IN IT.