

**Sample postadms | JAMB  
Past Questions**

**JAMB » Mathematics » 2014**

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1 Find the value of  $110111_2 + 10100_2$

A  $1101011_2$

B  $1001001_2$

C  $1001011_2$

D  $1001111_2$

---

2 A woman bought a grinder for N60,000. She sold it at a loss of 15%. How much did she sell it?

A N53,000

B N52,000

C N51,000

D N50,000

---

3 Express the product of 0.00043 and 2000 in standard form.

A  $8.6 \times 10^{-3}$

B  $8.3 \times 10^{-2}$

C  $8.6 \times 10^{-1}$

D  $8.6 \times 10$

---

4 A man donates 10% of his monthly net earnings to his church. If it amounts to N4,500, what is his net monthly income?

A N40,500

B N45,000

C N52,500

D N62,000

---

5 If  $\log 7.5 = 0.8751$ , evaluate  $2 \log 75 + \log 750$

A 6.6252

B 6.6253

C 66.252

D 66.253

---

## JAMB Past Questions

6 Solve for  $x$  in  $8x^{-2} = 2/25$

A 4

B 6

C 8

D 10

7 Simplify  $\frac{2\sqrt{2}-\sqrt{3}}{\sqrt{2}+\sqrt{3}}$

A  $3\sqrt{6} - 7$

B  $3\sqrt{6} - 7$

C  $3\sqrt{6} - 1$

D  $3\sqrt{6} + 1$

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8 Evaluate  $\text{Log}_2 8 + \text{Log}_2 16 - \text{Log}_2 4$

A 3

B 4

C 5

D 6

9 If  $P = \{1,2,3,4,5\}$  and  $P \cup Q = \{1,2,3,4,5,6,7\}$ ,  
list the elements in  $Q$

A  $\{6\}$

B  $\{7\}$

C  $\{6,7\}$

D  $\{5,6\}$

---

10 If  $gt^2 - k - w = 0$ , make  $g$  the subject of the  
formula

A  $\frac{k+w}{t^2}$

B  $\frac{k-w}{t^2}$

C  $\frac{k+w}{t}$

D  $\frac{k-w}{t}$

11 Factorize  $2y^2 - 15xy + 18x^2$

A  $(2y - 3x)(y + 6x)$

B  $(2y - 3x)(y - 6x)$

C  $(2y + 3x)(y - 6x)$

D  $(3y + 2x)(y - 6x)$

---

12 Find the value of **k** if  $y - 1$  is a factor of  $y^3 + 4y^2 + ky - 6$

A -6

B -4

C 0

**D** 1

---

**13**  $y$  varies directly as  $w^2$ . When  $y = 8$ ,  $w = 2$ . Find  $y$  when  $w = 3$

**A** 18

**B** 12

**C** 9

**D** 6

---

**14**  $P$  varies directly as  $Q$  and inversely as  $R$ . When  $Q = 36$  and  $R = 16$ ,  $P = 27$ . Find the relation between  $P$ ,  $Q$  and  $R$ .

**A**  $P = \frac{Q}{12R}$

**B**  $P = \frac{12Q}{R}$



**C**  $P = 12QR$

**D**  $P = \frac{12}{QR}$

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**15** What is the solution of  $\frac{x-5}{x+3} < -1$ ?

**A**  $-3 < x < 1$

**B**  $x < -3$  or  $x > 1$

**C**  $-3 < x < 5$

**D**  $x < -3$  or  $x > 5$

---

**Past Questions**

**16** Evaluate the inequality  $\frac{x}{2} + \frac{3}{4} \leq \frac{5x}{6} - \frac{7}{12}$

**A**  $x \geq 4$

**B**  $x \leq 3$

**C**  $x \geq -3$

**D**  $x \leq -4$

---

**17** The 4th term of an A.P. is 13 while the 10th term is 31. Find the 24th term.

**A** 89

**B** 75

**C** 73

**D** 69

---

**18** What is the common ratio of the G.P.

$(\sqrt{10} + \sqrt{5}) + (\sqrt{10} + 2\sqrt{5}) + \dots?$

**A**  $\sqrt{2}$

**B**  $\sqrt{5}$

**C** 3

**D** 5

---

**19** A binary operation  $*$  is defined by  $x * y = x^y$ . If  $x * 2 = 12 - x$ , find the possible values of  $x$

**A** 3,4

**B** 3,-4

**C** -3,4

**D** -3,-4

---

**20** Find  $y$ , if  $\begin{pmatrix} 5 & -6 \\ 2 & -7 \end{pmatrix} \begin{pmatrix} 5 \\ 2 \end{pmatrix} = \begin{pmatrix} 7 \\ -11 \end{pmatrix}$

**A** 8

**B** 5

**C** 3

**D** 2

---

## 3 Past Questions

21 If  $\begin{vmatrix} -x & 12 \\ -1 & 4 \end{vmatrix} = -12$ , find  $x$

**A** -6

**B** -2

**C** 3

**D** 6

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22 Find the value of  $\begin{vmatrix} 0 & 3 & 2 \\ 1 & 7 & 8 \\ 0 & 5 & 4 \end{vmatrix}$

A 12

B 10

C -1

D -2

---

23 How many sides has a regular polygon whose interior angle is  $135^\circ$

A 12

B 10

C 9

D 8

---

24 A cylindrical tank has a capacity of  $6160\text{m}^3$ .

What is the depth of the tank if the radius of its base is 28cm?

A 8.0m

B 7.5m

C 5.0m

D 2.5m

---

25 The locus of a dog tethered to a pole with a rope of 4m is a

A circle with diameter 4m

B circle with radius 4m

C semi-circle with diameter 4m

D semi-circle with radius 4m

---

26 Find the mid point of S(-5, 4) and T(-3, -2)

A -4, 2

B 4, -2

C -4, 1

D 4, -1

---

27 The gradient of a line joining (x,4) and (1,2) is  $\frac{1}{2}$ . Find the value of x

A 5

B 3

C -3

D -5

---

28 Calculate the mid point of the line segment  $y - 4x + 3 = 0$ , which lies between the x-axis and y-axis.

A  $(3 \quad -3 \quad 8 \quad 2)$

B  $(3 \quad 3 \quad 8 \quad 2)$

C  $(-2 \quad 2 \quad 2 \quad 2)$

D  $(-2 \quad 3 \quad 3 \quad 2)$

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29 Find the equation of the straight line through  $(-2, 3)$  and perpendicular to  $4x + 3y - 5 = 0$

A  $3x - 4y + 18 = 0$

B  $3x + 2y - 18 = 0$

C  $4x + 5y + 3 = 0$



**D**  $5x - 2y - 11 = 0$

---

**30** If  $\sin \theta = \frac{12}{13}$ , find the value of  $1 + \cos \theta$

**A**  $\frac{25}{13}$

**B**  $\frac{18}{13}$

**C**  $\frac{8}{13}$

**D**  $\frac{5}{13}$

---

## JAMB Past Questions

**31** If  $y = 4x^3 - 2x^2 + x$ , find  $\frac{\delta y}{\delta x}$

**A**  $8x^2 - 2x + 1$

**B**  $8x^2 - 4x + 1$

**C**  $12x^2 - 2x + 1$

**D**  $12x^2 - 4x + 1$

---

**32** If  $y = \cos 3x$ , find  $\frac{\delta y}{\delta x}$

**A**  $\frac{1}{3} \sin 3x$

**B**  $-\frac{1}{3} \sin 3x$

**C**  $3 \sin 3x$

**D**  $-3 \sin 3x$

---

**33** Find the minimum value of  $y = x^2 - 2x - 3$

**A** 4

**B** 1

**C** -1

**D** -4

---

**34** Evaluate  $\int \sin 2x dx$

**A**  $\cos 2x + k$

**B**  $\frac{1}{2} \cos 2x + k$

**C**  $-\frac{1}{2} \cos 2x + k$

**D**  $-\cos 2x + k$

---

**35** Evaluate  $\int (2x + 3)^{\frac{1}{2}} dx$

**A**  $\frac{1}{12} (2x + 3)^6 + k$

**B**  $\frac{1}{3} (2x + 3)^{\frac{1}{2}} + k$

**C**  $\frac{1}{3} (2x + 3)^{\frac{3}{2}} + k$

**D**  $\frac{1}{12} (2x + 3)^{\frac{3}{4}} + k$

## AMB Past Questions

36 The mean of  $2 - 4$ ,  $4 + t$ ,  $3 - 2t$  and  $t - 1$  is

A  $t$

B  $-t$

C  $2$

D  $-2$

---

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<i>Values</i>	0	1	2	3	4
<i>Frequency</i>	1	2	2	1	9

Find the mode of the distribution above

A  $1$

**B** 2

**C** 3

**D** 4

---

**38** Find the median of 5, 9, 1, 10, 3, 8, 9, 2, 4, 5, 5, 5, 7, 3  
and 6

**A** 6

**B** 5

**C** 4

**D** 3

---

**39** Find the standard deviation of 5, 4, 3, 2, 1

**A**  $\sqrt{2}$

**B**  $\sqrt{3}$

C  $\sqrt{6}$

D  $\sqrt{10}$

---

40 In how many ways can a team of 3 girls be selected from 7 girls?

A  $\frac{7!}{3!}$

B  $\frac{7!}{4!}$

C  $\frac{7!}{3!4!}$

D  $\frac{7!}{2!5!}$

---

## Past Questions

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<i>Numbers</i>	1	2	3	4	5	6
<i>Frequency</i>	18	22	20	16	10	14

The table above represents the outcome of throwing a

die 100 times. What is the probability of obtaining at least a 4?

**A**  $\frac{1}{5}$

**B**  $\frac{1}{2}$

**C**  $\frac{2}{5}$

**D**  $\frac{3}{4}$

---

**42** A number is chosen at random from 10 to 30

both inclusive. What is the probability that the number is divisible by 3?

**A**  $\frac{2}{15}$

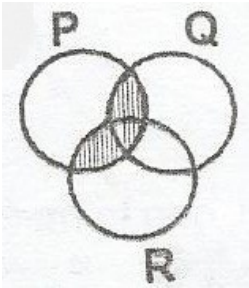
**B**  $\frac{1}{10}$

**C**  $\frac{1}{3}$

**D**  $\frac{2}{5}$

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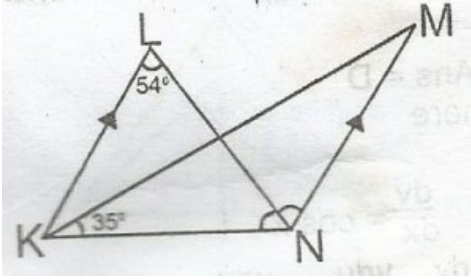


From the venn diagram above, the shaded parts represent

- A**  $(P \cap Q) \cup (P \cap R)$
  - B**  $(P \cup Q) \cap (P \cap R)$
  - C**  $(P \cup Q) \cup (P \cup R)$
  - D**  $(P \cap Q) \cup (P \cup R)$
- 

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In the figure above,  $KL \parallel NM$ ,  $LN$  bisects  $\angle KNM$ . If angles  $KLN$  is  $54^\circ$  and angle  $MKN$  is  $35^\circ$ , calculate the size of angle  $KMN$ .

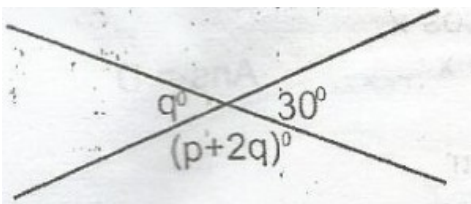
**A**  $91^\circ$

**B**  $89^\circ$

**C**  $37^\circ$

**D**  $19^\circ$

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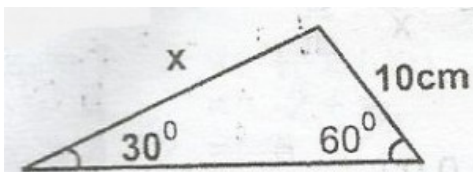


From the figure above, what is the value of  $p$ ?

- A**  $135^\circ$
  - B**  $90^\circ$
  - C**  $60^\circ$
  - D**  $45^\circ$
- 

## Past Questions

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Find the value of  $x$  in the figure above

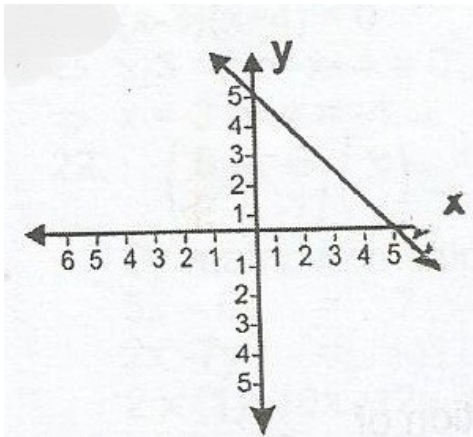
- A**  $20\sqrt{3}\text{cm}$
- B**  $10\sqrt{3}\text{cm}$

**C**  $5\sqrt{3}\text{cm}$

**D**  $4\sqrt{3}\text{cm}$

---

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in the figure above, what is the equation of the line that passes the y-axis at (0,5) and passes the x-axis at (5,0)?

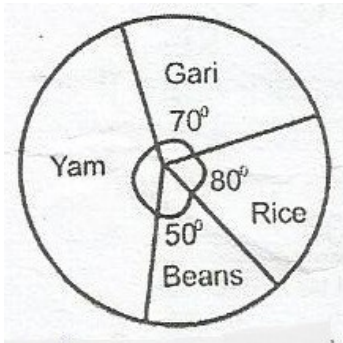
**A**  $y = x + 5$

**B**  $y = -x + 5$

**C**  $y = x - 5$

**D**  $y = -x - 5$

---



The pie chart above shows the monthly distribution of a man's salary on food items. If he spent N8,000 on rice, how much did he spent on yam?

- A** N42,000
  - B** N18,000
  - C** N16,000
  - D** N12,000
-

# Answers: JAMB Past Questions: JAMB » Mathematics » 2014

1. C

2. C

$$SP = Nx$$

$$CP = N60,000$$

$$\text{Percentage loss} = 15\%$$

Using percentage loss...

$$\frac{CP-SP}{CP} = 100\%$$

$$15\% = \frac{60000-x}{60000} \times 100\%$$

$$15\% \times 60000 = (60000 - x)100\%$$

$$60000 - x = \frac{15\% \times 60000}{100\%}$$

$$60000 - x = 3 \times 3000$$

$$60000 - x = 9000$$

$$x = 60000 - 9000$$

$$x = \text{N}51,000$$

**3. C**

$$0.00043 \times 2000$$

$$= 43 \times 10^{-5} \times 2 \times 10^3$$

$$= 43 \times 2 \times 10^{-5+3}$$

$$= 86 \times 10^{-2}$$

$$= 8.6 \times 10^1 \times 10^{-2}$$

$$= 8.6 \times 10^{-1}$$

**4. B**

Let;

$M$  = Man monthly net earnings

Then;

$$\text{N}4500 = \frac{10\%}{100\%} \times M$$

$$M = \frac{N4500 \times 100\%}{10\%}$$

$$M = N45,000$$

## 5. B

$$\text{If } \log 7.5 = 0.8751$$

$$\text{Then } 2\log 75 + \log 750$$

$$= 2(1.8751) + 2.8751$$

$$= 3.7502 + 2.8751$$

$$= 6.6253$$

## 6. D

$$8x^{-2} = 2/25$$

$$x^{-2} = 2/25 \times 1/8$$

$$x^{-2} = 2/200$$

$$x^{-2} = 1/100$$

$$1/x^2 = 1/100$$

$$x^2 = 100$$

$$x = 10$$

## 7. A

$$\begin{aligned} &= \frac{2\sqrt{2}-\sqrt{3}}{\sqrt{2}+\sqrt{3}} \times \frac{\sqrt{2}-\sqrt{3}}{\sqrt{2}+\sqrt{3}} \\ &= \frac{2\sqrt{2}(\sqrt{2})+(2\sqrt{2})(-\sqrt{3})-\sqrt{3}(\sqrt{2})-\sqrt{3}(-\sqrt{3})}{(\sqrt{2})^2-(\sqrt{3})^2} \\ &= \frac{2 \times 2 - 2\sqrt{6} - \sqrt{6} + 3}{2-3} \\ &= \frac{4-3\sqrt{6}+3}{-1} \\ &= \frac{7-3\sqrt{6}}{-1} \\ &= \frac{7}{-1} - \frac{3\sqrt{6}}{-1} \\ &= -7 + 3\sqrt{6} \\ &= 3\sqrt{6} - 7 \end{aligned}$$

## 8. C

$$\begin{aligned} &= \log_2 \frac{8 \times 16}{4} \\ &= \log_2 32 \\ &= \log_2 2^5 \end{aligned}$$



$$= 5 \log_2 2$$

$$= 5 \times 1$$

$$= 5$$

**9. C**

$$Q = (P \cup Q) - P$$

{6,7}

**10. A**

$$gt^2 - k - w = 0$$

$$gt^2 = k + w$$

$$g = \frac{k+w}{t^2}$$

---

**11. B**

$$2y^2 - 15xy + 18x^2$$

$$2y^2 - 12xy - 3xy + 18x^2$$

$$2y(y - 6x) - 3x(y - 6x)$$

$$(2y - 3x)(y - 6x)$$

## 12. D

if  $y - 1$  is a factor of  $y^3 + 4y^2 + ky - 6$ , then

$$f(1) = (1)^3 + 4(1)^2 + k(1) - 6 = 0 \text{ (factor theorem)}$$

$$1 + 4 + k - 6 = 0$$

$$5 - 6 + k = 0$$

$$-1 + k = 0$$

$$k = 1$$

## 13. A

$$y \propto w^2$$

$$y = kw^2$$

$$8 = k(2)^2$$

$$8 = k(4)$$

$$k = 8/4$$

$$k = 2$$

$$\text{Thus } y = 2w^2$$

$$\text{When } w = 3, y = 2(3)^2$$

$$y = 2 \times 9 = 18$$

**14. B**

$$P \propto \frac{Q}{R}$$

$$P = K \frac{Q}{R}$$

$$\text{When } Q = 36, R = 16, P = 27$$

Then substitute into the equation

$$27 = K \frac{36}{16}$$

$$K = \frac{27 \times 16}{36}$$

$$K = 12$$

So the equation connecting P, Q and R is

$$P = \frac{12Q}{R}$$

### 15. A

Consider the range  $-3 < x < -1$

$= \{-2, -1, 0\}$ , for instance

When  $x = -2$ ,

$$\frac{-2-5}{-2+3} < -1$$

$$\frac{-7}{1} < -1$$

When  $x = -1$ ,

$$\frac{-1-5}{-1+3} < -1$$

$$\frac{-6}{2} < -1$$

$$= -3 < -1$$

When  $x = 0$ ,

$$\frac{0-5}{0+3} < -1$$

$$\frac{-5}{3} < -1$$

Hence  $-3 < x < 1$

**16. A**

$$\frac{x}{2} + \frac{3}{4} \leq \frac{5x}{6} - \frac{7}{12}$$

$$12\frac{x}{2} + 12\frac{3}{4} \leq 12\frac{5x}{6} - 12\frac{7}{12}$$

$$6x + 9 \leq 10x - 7$$

$$6x - 10x \leq -7 - 9$$

$$-4x \leq -16$$

$$-4x/-4 \geq -16/-4$$

$$x \geq 4$$

**17. C**

$$a + 3d = 13 \dots\dots\dots (1)$$

$$a + 9d = 31 \dots\dots\dots (2)$$

$$(2) - (1): 6d = 18$$

$$d = 18/6 = 3$$

$$\text{From (1), } a + 3(3) = 13$$

$$a + 9 = 13$$

$$a = 13 - 9 = 4$$

Hence,

$$T_{24} = a + 23d$$

$$T_{24} = 4 + 23(3)$$

$$T_{24} = 4 + 69$$

$$T_{24} = 73$$

**18. A**

Common ratio  $r$  of the G.P is

$$r = \frac{T_{n+1}}{T_n} = \frac{T_2}{T_1}$$

$$r = \frac{\sqrt{10} + 2\sqrt{5}}{\sqrt{10} + \sqrt{5}}$$

$$r = \frac{\sqrt{10} + 2\sqrt{5}}{\sqrt{10} + \sqrt{5}} \times \frac{\sqrt{10} - \sqrt{5}}{\sqrt{10} - \sqrt{5}}$$

$$= \frac{(\sqrt{10})(\sqrt{10}) + (\sqrt{10})(-\sqrt{5}) + (2\sqrt{5})(\sqrt{10}) + (2\sqrt{5})(-\sqrt{5})}{(\sqrt{10})^2 - (\sqrt{5})^2}$$

$$\frac{10 - \sqrt{50} + 2\sqrt{50} - 10}{10 - 5}$$

$$\frac{\sqrt{50}}{5}$$

$$\frac{\sqrt{25 \times 2}}{5}$$

$$\frac{5\sqrt{2}}{5}$$

$$\sqrt{2}$$

**19. B**

$$x * y = x^y$$

$$x * 2 = 12 - x$$

Thus by comparison,

$$x = x, y = 2$$

$$\text{But } x * y = x * 2$$

$$x^y = 12 - x$$

$$x^2 = 12 - x$$

$$x^2 + x - 12 = 0$$

$$x^2 + 4x - 3x - 12 = 0$$

$$x(x + 4) - 3(x + 4) = 0$$

$$(x - 3)(x + 4) = 0$$

$$x - 3 = 0 \text{ or } x + 4 = 0$$

$$\text{So } x = 3 \text{ or } x = -4$$

**20. C**

$$\begin{pmatrix} 5 & -6 \\ 2 & -7 \end{pmatrix} \begin{pmatrix} 5 \\ 2 \end{pmatrix} = \begin{pmatrix} 7 \\ -11 \end{pmatrix}$$

By matrices multiplication;

$$5x - 6y = 7 \text{ .....(1)}$$

$$2x - 7y = -11 \text{ .....(2)}$$

$$2 \times (1): 10x - 12y = 14 \text{ .....(3)}$$

$$5 \times (2): 10x - 35y = -55 \text{ .....(4)}$$

$$(3) - (4): 23y = 69$$

$$y = 69/23 = 3$$

---

**21. D**



$$\begin{vmatrix} -x & 12 \\ -1 & 4 \end{vmatrix} = -12$$

$$-4x - (-1)12 = -12$$

$$-4x + 12 = -12$$

$$-4x = -12 - 12$$

$$-4x = -24$$

$$x = 6$$

**22. D**

$$0 \begin{vmatrix} 7 & 8 \\ 5 & 4 \end{vmatrix} - 3 \begin{vmatrix} 1 & 8 \\ 0 & 4 \end{vmatrix} + 2 \begin{vmatrix} 1 & 7 \\ 0 & 5 \end{vmatrix}$$

$$= 0(28 - 40) - 3(4 - 0) + 2(5 - 0)$$

$$= 0(-12) - 3(4) + 2(5)$$

$$= 0 - 12 + 10$$

$$= -2$$

**23. D**

If each interior angle of the polygon is  $135^\circ$ , then each exterior angle is  $180^\circ - 135^\circ = 45^\circ$ . Hence, number of sides =

$$\frac{360^\circ}{\text{one exterior angle}}$$

$$\frac{360^\circ}{45^\circ}$$

$$= 8$$

**24. D**

Using  $V = \pi r^2 h$

$$6160 = \frac{22}{7} \times 28 \times 28 \times h$$

$$h = \frac{6160}{22 \times 4 \times 28}$$

$$h = 2.5m$$

**25. B**

**26. C**

Mid point of S(-5, 4) and T(-3, -2) is

$$\left[ \frac{1}{2}(-5 + -3), \frac{1}{2}(4 + -2) \right]$$

$$\left[\frac{1}{2}(x_1 + x_2), \frac{1}{2}(y_1 + y_2)\right]$$

$$\left[\frac{1}{2}(-8), \frac{1}{2}(2)\right]$$

$$[-4, 1]$$

**27. A**

$$\text{Gradient } m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{1}{2} = \frac{2 - 4}{1 - x}$$

$$1 - x = 2(2 - 4)$$

$$1 - x = 4 - 8$$

$$1 - x = -4$$

$$-x = -4 - 1$$

$$x = 5$$

**28. A**

$$y - 4x + 3 = 0$$

$$\text{When } y = 0, 0 - 4x + 3 = 0$$

$$\text{Then } -4x = -3$$

$$x = 3/4$$

So the line cuts the x-axis at point  $(3/4, 0)$ .

$$\text{When } x = 0, y - 4(0) + 3 = 0$$

$$\text{Then } y + 3 = 0$$

$$y = -3$$

So the line cuts the y-axis at the point  $(0, 3)$

Hence the midpoint of the line  $y - 4x + 3 = 0$ , which lies between the x-axis and the y-axis is;

$$\left[ \frac{1}{2}(x_1 + x_2), \frac{1}{2}(y_1 + y_2) \right]$$

$$\left[ \frac{1}{2}\left(\frac{3}{4} + 0\right), \frac{1}{2}(0 + -3) \right]$$

$$\left[ \frac{1}{2}\left(\frac{3}{4}\right), \frac{1}{2}(-3) \right]$$

$$\left[ \frac{3}{8}, \frac{-3}{2} \right]$$

**29. A**

$$4x + 3y - 5 = 0 \text{ (given)}$$

The equation of the line perpendicular to the given line takes the form  $3x - 4y = k$

Thus, substitution  $x = -2$  and  $y = 3$  in  $3x - 4y = k$  gives;

$$3(-2) - 4(3) = k$$

$$-6 - 12 = k$$

$$k = -18$$

Hence the required equation is  $3x - 4y = -18$

$$3x - 4y + 18 = 0$$

**30. B**

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**31. D**

If  $y = 4x^3 - 2x^2 + x$ , then;

$$\frac{\delta y}{\delta x} = 3(4x^2) - 2(2x) + 1$$

$$= 12x^2 - 4x + 1$$

### 32. D

$$y = \cos 3x$$

Let  $u = 3x$  so that  $y = \cos u$

$$\text{Now, } \frac{\delta y}{\delta x} = 3,$$

$$\frac{\delta y}{\delta x} = -\sin u$$

By the chain rule,

$$\frac{\delta y}{\delta x} = \frac{\delta y}{\delta u} \times \frac{\delta u}{\delta x}$$

$$\frac{\delta y}{\delta x} = (-\sin u)(3)$$

$$\frac{\delta y}{\delta x} = -3 \sin u$$

$$\frac{\delta y}{\delta x} = -3 \sin 3x$$

### 33. D

$$y = x^2 - 2x - 3,$$

$$\text{Then } \frac{\delta y}{\delta x} = 2x - 2$$

$$\text{But at minimum point, } \frac{\delta y}{\delta x} = 0,$$

$$\text{Which means } 2x - 2 = 0$$

$$2x = 2$$

$$x = 1.$$

Hence the minimum value of  $y = x^2 - 2x - 3$  is;

$$y_{\min} = (1)^2 - 2(1) - 3$$

$$y_{\min} = 1 - 2 - 3$$

$$y_{\min} = -4$$

**34. C**

$$\int \sin 2x dx = \frac{1}{2}(-\cos 2x) + k$$

$$-\frac{1}{2}\cos 2x + k$$

**35. C**

$$\int (2x + 3)^{\frac{1}{2}} \delta x$$

$$\text{let } u = 2x + 3, \frac{\delta y}{\delta x} = 2$$

$$\delta x = \frac{\delta u}{2}$$

$$\text{Now } \int (2x + 3)^{\frac{1}{2}} \delta x = \int u^{\frac{1}{2}} \cdot \frac{\delta x}{2}$$

$$= \frac{1}{2} \int u^{\frac{1}{2}} \delta u$$

$$= \frac{1}{2} u^{\frac{3}{2}} \times \frac{2}{3} + k$$

$$= \frac{1}{3} u^{\frac{3}{2}} + k$$

$$= \frac{1}{3} (2x + 3)^{\frac{3}{2}} + k$$

### 36. C

$$\text{Mean } x = \frac{\sum x}{n}$$

$$= [(2 - t) + (4 + t) + (3 - 2t) + (2 + t) + (t - 1) \div] 5$$

$$= [11 - 1 + 3t - 3t] \div 5$$

$$= 10 \div 5$$



$$= 2$$

**37. D**

**38. B**

First arrange the numbers in order of magnitude;  
1,2,3,3,4,5,5,5,5,6,7,8,9,9,10

Hence the median = 5

**39. A**

$$\text{Mean } x = \frac{\sum x}{n}$$

$$= \frac{5+4+3+2+1}{5}$$

$$= \frac{15}{5}$$

$$= 3$$

$x$	$d = x - 3$	$d^2$
5	2	4
4	1	1
3	0	0
2	-1	1
1	-2	4
		$\sum d^2 + 10$

Hence, standard deviation;

$$= \sqrt{\frac{\sum d^2}{n}} = \sqrt{\frac{10}{5}}$$

$$= \sqrt{2}$$

**40. C**

A team of 2 girls can be selected from 7 girls in  ${}^7C_3$

$$= \frac{7!}{(7-3)!3!}$$

$$= \frac{7!}{4!3!} \text{ ways}$$


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## 41. C

Let E demote the event of obtaining at least a 4  
Then  $n(E) = 16 + 10 + 14 = 40$

$$\text{Hence, prob (E)} = \frac{n(E)}{n(S)}$$

$$= \frac{40}{100}$$

$$= \frac{2}{5}$$

## 42. C

Sample space  $S = \{10, 11, 12, \dots 30\}$

Let E denote the event of choosing a number  
divisible by 3

Then  $E = \{12, 15, 18, 21, 24, 27, 30\}$  and  $n(E) = 7$

$$\text{Prob (E)} = \frac{n(E)}{n(S)}$$

$$\text{Prob (E)} = \frac{7}{21}$$

$$\text{Prob (E)} = \frac{1}{3}$$

## 43. A

#### 44. C

In the diagram above,  $\alpha = 54^\circ$  (alternate angles;  $KL \parallel MN$ )  $\angle KNM = 2\alpha$  (LN is bisector of  $\angle KNM$ ) =  $108^\circ$

$$35^\circ + \angle KMN + 108^\circ = 180^\circ \text{ (sum of angles of } \triangle \text{)}$$

$$\angle KMN + 143^\circ = 180^\circ$$

$$\angle KMN = 180^\circ - 143^\circ$$

$$= 37^\circ$$

#### 45. B

In the figure above,  $q^\circ = 30^\circ$  (vertically opposite angles)

$$(P + 2q)^\circ + 30^\circ = 180^\circ \text{ (angles on a straight line)}$$

$$p + 2 \times 30^\circ + 30^\circ = 180^\circ$$

$$p + 60^\circ + 30^\circ = 180^\circ$$

$$p + 90^\circ = 180^\circ$$

$$p = 180^\circ - 90^\circ$$

$$= 90^\circ$$

**46. B**

In the figure above,  $\frac{x}{\sin 60^\circ} = \frac{10}{\sin 30^\circ}$  (Sine rule)

$$x = \frac{10 \sin 60^\circ}{\sin 30^\circ}$$

$$= 10 \times \frac{\sqrt{3}}{2} \times \frac{1}{2}$$

$$= 10 \times \frac{\sqrt{3}}{2} \times \frac{2}{1}$$

$$= 10\sqrt{3}\text{cm}$$

**47. B**

$$(x_1, y_1) = (0, 5)$$

$$(x_2, y_2) = (5, 0)$$

$$\text{Using } \frac{y-y_1}{y_1-y_2} = \frac{x-x_1}{x_1-x_2}$$

$$\frac{y-5}{0-5} = \frac{x-0}{5-0}$$

$$\frac{y-5}{-5} = \frac{x}{5}$$

$$5(y - 5) = -5x$$

$$y - 5 = -x$$

$$x + y = 5$$

$$y = -x + 5$$

48. C

Angle of sector subtended by yam

$$= 360^\circ - (70 + 80 + 50)^\circ$$

$$= 360^\circ - 200^\circ$$

$$= 160^\circ$$

$$\text{But } \frac{80^\circ}{360^\circ} \times T = 8000$$

$$T = \frac{8000 \times 360^\circ}{80^\circ}$$

$$= \text{N}36,000$$

$$\text{Hence the amount spent on yam} = \frac{160^\circ}{260} \times \text{N}36,000$$

= N16,000

ng

20  
11