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## CLASS IX ENTRANCE EXAM

# SOLVED PAPER 2018

## Part I English

**Directions** (Q. Nos. 1-15) *Read the passage carefully and choose the best answer to each question out of the four alternatives.*

### Passage

Chameleons can make their skin colour change, but not because they decide to. The colour changes to help the chameleon avoid its enemies. It is a form of camouflage, a disguise that lets it blend in with its surroundings. The changes are actually determined by environmental factors, such as light and temperature.

Bright sunlight causes the skin to get darken. On cool nights, the colour fades to a creamy colour. The colour also changes when chameleons are excited, angry or afraid. The colour change is rapid and increases when the chameleon is handled, injured, or approached by another chameleon. There are many types of chameleons. Almost half of them are found on the African Island of Madagascar. The others mostly occur in the Sahara desert, with few in Western Asia and Southern Europe. Chameleons live in trees; where they usually eat insects. Very large chameleons may even use their sticky tongues to catch birds.

**1.** A chameleon's colour changes to help it
(a) fly away
(b) look beautiful
(c) avoid its enemies
(d) attract prey

**2.** Chameleons change colour when they are
(a) excited, angry or hungry
(b) afraid, excited or angry
(c) angry, excited or happy
(d) afraid, angry or hungry

**3.** The colour changing ability of a chameleon is a form of camouflage which is a
(a) colour that fades
(b) disguise that lets it blend in with its surroundings
(c) dance done by chameleons
(d) disease which affects chameleons

**4.** The colour changes are determined by
(a) light and wind
(b) light and pressure
(c) light and temperature
(d) pressure and temperature

**5.** Half of the world's chameleons are found
(a) on the Asian Island of Madagascar
(b) in the Sahara Desert
(c) on the African Island of Madagascar
(d) in the continent of Asia

**Directions** (Q. Nos. 6-8) *Fill in the blanks with the correct parts of speech from the given alternatives.*

**6.** How much did you spend ..... roses?
(a) in (b) on (c) of (d) from

**7.** I could hardly recognise him ..... I saw him.
(a) after (b) but (c) and (d) when

**8.** Our teacher encouraged ..... setting the poem to music.
(a) his (b) him (c) he (d) he's

**9.** Choose the correct passive from of the given sentence from the following
Don't subject the animals to cruelty
(a) The animals are not to be subjected to cruelty
(b) The animals shall not be subjected to cruelty
(c) The animals will not be subjected to cruelty
(d) The animals should not be subjected to cruelty

**Directions** (Q. Nos. 10 and 11) *Fill in the blanks with a suitable clause to complete the sentences*

**10.** No one knows…… .
(a) who he is (b) whom he is
(c) why he is (d) when he is

**11.** She will not let you go …… .
(a) unless you will bless her
(b) unless you do not bless her
(c) unless you bless her (d) if you bless her

**Directions** (Q. Nos. 12 and 13) *Choose the one word which can be substituted for the given words/sentences.*

**12.** That which can be drunk.
(a) edible (b) palatable
(c) culpable (d) potable

**13.** Something that is beyond the power of nature.
(a) Supernatural
(b) magical
(c) preternatural
(d) unnatural

**Directions** (Q. Nos. 14 and 15) *In the following questions choose the word opposite in meaning to the given word.*

**14.** Boisterous
(a) Naughty (b) Quiet
(c) Reserved (d) Bouncy

**15.** Veteran
(a) Activist (b) Enthusiast
(c) Novice (d) Master

# Part II हिन्दी

**16.** 'श्याम कल मुम्बई जाएगा' वाक्य में कौन-सा काल है?
(a) भूतकाल
(b) भविष्यत् काल
(c) वर्तमान काल
(d) उपरोक्त में से कोई नहीं

**17.** 'समुद्र अधिक गहरा है' इस वाक्य का शुद्ध रूप क्या है?
(a) समुद्र बड़ा गहरा है
(b) समुद्र अधिकांश गहरा है
(c) समुद्र बहुत गहरा है
(d) समुद्र की गहराई अधिक ज्यादा है

**18.** 'सजीव' का विलोम शब्द होगा
(a) निर्जीव (b) अजीव
(c) परजीव (d) इनमें से कोई नहीं

**19.** 'भवन-भुवन' भिन्नार्थक शब्दों के उचित युग्मों का चयन कीजिए।
(a) मकान-संसार (b) पराक्रम-ग्रन्थ
(c) मकान-घर (d) हंस-घर

**निर्देश** (प्र. सं. 20-24) *दिए गए अनुच्छेद को ध्यानपूर्वक पढ़िए और उससे सम्बन्धित प्रश्नों के उत्तर दीजिए।*

सच्चे वीर अपने प्रेम के जोर से लोगों को सदा के लिए बाँध देते हैं। वीरता की अभिव्यक्ति कई प्रकार से कभी लड़ने-मरने से, खून बहाने से, तोप तलवार के सामने बलिदान करने से, तो कभी जीवन के गूढ़ तत्त्व और सत्य की तलाश में बुद्ध जैसे राजा विरक्त होकर वीर हो जाते हैं। वीरता एक प्रकार की अन्तः प्रेरणा है। जब कभी उसका विकास हुआ तभी एक रौनक, एक रंग, एक बहार संसार में छा गई। वीरता हमेशा निराली और नई होती है, वीरों को बनाने के कारखाने नहीं होते, वे तो देवदार के वृक्ष की भाँति जीवन रूपी वन में स्वयं पैदा होते हैं और बिना किसी के पानी दिए, बिना किसी के दूध पिलाए बढ़ते हैं। ''जीवन के केन्द्र में निवास करो और सत्य की चट्टान पर दृढ़ता से खड़े हो जाओ। बाहर की सतह छोड़कर जीवन के अन्दर की तहों मे पहुँचे तब नए रंग खिलेंगे।'' यही वीरता का सन्देश है।

**20.** वीरता कैसी प्रेरणा है?
(a) अन्तः (b) बाह्य
(c) फलित (d) ये सभी

**21.** देवदार वृक्ष से किसकी तुलना की गई है
(a) खाने-पीने की (b) वीरों की
(c) मनुष्य की (d) वीरता की

**22.** निम्नलिखित में से कौन-सा रूप वीरता का नहीं है?
(a) क्रोध (b) युद्ध (c) त्याग (d) दान

**23.** वीरता का एक विशेष लक्षण है
(a) नयापन (b) नकल (c) हास्य (d) करुणा

**24.** वीरता का सन्देश क्या है?
(a) यह संकल्प कि किसी भी हालत में युद्ध जीतना है
(b) बुद्ध जैसे राजा की भाँति विरक्त होना
(c) उद्देश्य के लिए सच्चाई पर चट्टान की तरह अटल रहना
(d) हमेशा नया और निराला रहना

**25.** 'लोहे के चने चबाना' मुहावरे का अर्थ है।
(a) कठिन कार्य करना (b) अधिक परेशान करना
(c) चने चबाना (d) उपरोक्त में से कोई नहीं

**26.** 'अतिथि' का पर्यायवाची है
(a) भगवान (b) विकास
(c) वसन (d) आगन्तुक

**27.** 'जिसके समान कोई दूसरा न हो' के लिए एक शब्द है
(a) अचल (b) अद्वितीय
(c) अनगिनत (d) अभिज्ञ

**28.** निम्न में कौन-सा शब्द शुद्ध है?
(a) अविषकार (b) आाविषकार
(c) आविष्कार (d) अवनिषकार

**29.** उत्पत्ति के आधार पर शब्द के कितने प्रकार होते हैं?
(a) तीन (b) चार
(c) एक (d) दो

**30.** विशेषण जिस संज्ञा या सर्वनाम शब्द की विशेषता बताते हैं, उन्हें ..... कहते हैं।
(a) विशेष्य
(b) गुणवाचक विशेषण
(c) संख्यावाचक विशेषण
(d) परिमाणवाचक विशेषण

# Part III Mathematics

**31.** The difference in the measures of two complementary angles is $12^\circ$, then the measures of the angles, are
(a) $51^\circ, 39^\circ$ (b) $60^\circ, 30^\circ$
(c) $45^\circ, 45^\circ$ (d) $51^\circ, 51^\circ$

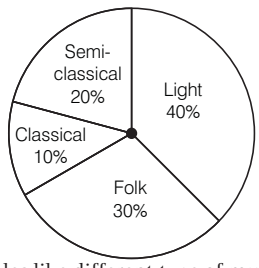
**32.** The surface area of a sphere of diameter 14 cm, is
(a) 166 $cm^2$ (b) 196 $cm^2$
(c) 661 $cm^2$ (d) 616 $cm^2$

**33.** The sum of three consecutive even numbers is 138, then the greatest of these numbers is
(a) 44 (b) 46
(c) 42 (d) 48

**34.** The factorisation of $84 - 2r - 2r^2$, is
(a) $(6 - r)(r + 7)$ (b) $(7 - r)(r + 6)$
(c) $2(6 - r)(r + 7)$ (d) $2(7 - r)(r + 7)$

**35.** If $\frac{x^2 + y^2}{x^2 - y^2} = \frac{17}{8}$, then the value of $x : y$, is
(a) 3 : 5 (b) 5 : 3
(c) 3 : 8 (d) 5 : 8

**Directions** (Q. Nos. 36 and 37) *A pie chart is given below*



Peoples like different type of music

**36.** Which type of music is liked by the maximum number of people ?
(a) Semi-Classical (b) Classical
(c) Light (d) Folk

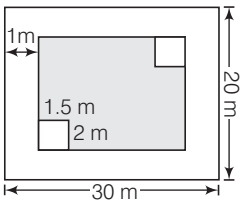
**37.** If a cassette company were to make 1000 CD'S, how many of semi-classical and folk would they make ?
(a) 200, 400 (b) 100, 300
(c) 200, 300 (d) 100, 400

**38.** The value of $\frac{\sqrt{24} + \sqrt{216}}{\sqrt{96}}$, is
(a) 8 (b) 6 (c) 4 (d) 2

**39.** Navin purchased a cellphone for ₹ 12000 and sold it for ₹ 8000, then his loss per cent, is
(a) 30% (b) 33%
(c) $33\frac{1}{3}\%$ (d) $34\frac{1}{3}\%$

**40.** The value of $(3x + 2y)^2 + (3x - 2y)^2$, is
(a) $9x^2 + 4y^2$ (b) $18x^2 + 8y^2$
(c) $12xy$ (d) $24xy$

**41.** There are two rectangular flower beds of size 1.5 m × 2 m each in the park as shown in the given figure and the rest has grass on it, then the area covered by grass, is




(a) 498 $m^2$ (b) 948 $m^2$
(c) 894 $m^2$ (d) 849 $m^2$

**42.** If $5^{3x-1} \div 25 = 125$, then the value of $x$, is
(a) 4 (b) 3
(c) 2 (d) 1

**43.** A car is travelling 60 km in 2 h, then the distance travelled by the car in 6 h, if the speed remains constant, is
(a) 60 km (b) 120 km
(c) 180 km (d) 240 km

**44.** If $x - \frac{1}{x} = 7$, then the value of $x^2 + \frac{1}{x^2}$, is
(a) 49 (b) 50
(c) 51 (d) 52

**45.** A pair of integers whose product is–36 and whose difference is 15, is
(a) –3,12 (b) –12, 3
(c) 9, – 4 (d) 4, – 9

**46.** The HCF of $\frac{12}{7}, \frac{18}{7}, \frac{24}{7}$, is
(a) 12/7 (b) 6/7 (c) 4/7 (d) 3/7

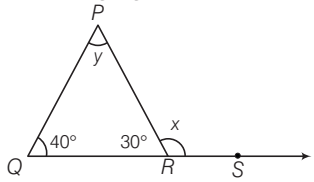
**47.** By prime factorisation , the value of the cube root of 5832, is
(a) 16 (b) 17 (c) 18 (d) 19

**48.** If two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 3 : 2 , then the greater of the two angles, is
(a) $72^\circ$ (b) $36^\circ$ (c) $108^\circ$ (d) $44^\circ$

**49.** The nature of $(-5 + 2\sqrt{5} - \sqrt{5})$ is
(a) natural (b) integer
(c) rational (d) irrational

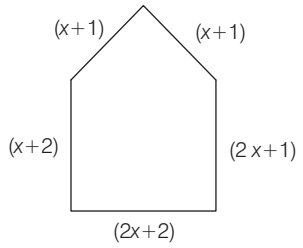
**50.** If the total surface area of a cube is 486 $cm^2$, then its lateral surface area.
(a) 243 $cm^2$ (b) 342 $cm^2$ (c) 324 $cm^2$ (d) 432 $cm^2$

**51.** In the following figure, then the value of $2x$, is




(a) $300^\circ$ (b) $200^\circ$ (c) $100^\circ$ (d) $50^\circ$

**52.** For what value of $x$, the perimeter of shape is 77 cm ?




(a) 14 cm (b) 12 cm (c) 10 cm (d) 8 cm

**53.** If $p(x) = x^3 - 4x^2 + x + 6$, then the value of $p(3)$ is
(a) 27 (b) 10 (c) 4 (d) 0

**54.** If $a : b = 5 : 3$, then the value of $(5a + 8b) : (6a - 7b)$, is
(a) 9 : 49 (b) 49 : 9
(c) 11 : 50 (d) 50 : 11

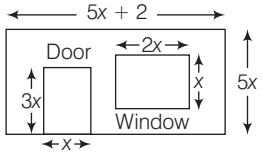
**55.** If you have a spinning wheel with 3 green sectors, 5 black sectors and 10 red sectors , then the probability of getting a non-black sector, is
(a) $\frac{1}{9}$ (b) $\frac{1}{6}$
(c) $\frac{5}{9}$ (d) $\frac{13}{18}$

**56.** The value of $\sqrt{248 + \sqrt{52 + \sqrt{144}}}$, is
(a) 17 (b) 16
(c) 15 (d) 14

**57.** Find the compound interest on ₹ 48000 for one year at 8% per annum, when compunded half-yearly.
(a) ₹ 51916 (b) ₹ 51916.80
(c) ₹ 3916.80 (d) ₹ 3910.80

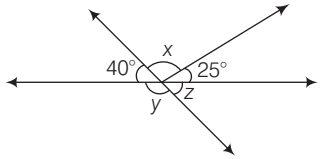
**58.** If lemons were bought at ₹ 48 per dozen and sold at the rate of ₹ 48 per 10, then the gain or loss per cent, is
(a) 40% profit (b) 40% loss
(c) 20% profit (d) 20% loss

**59.** The alongside figure shows the dimensions of a wall having a window and a door of a room. Then, the algebraic expression for the area of the wall to be painted, is




(a) $x(2x + 1)$ sq unit
(b) $2x(x + 1)$ sq unit
(c) $10x(2x + 1)$ sq unit
(d) $(x + 1)$ sq unit

**60.** The values of the angles $x$, $y$ and $z$ are respectively, (see figure)




(a) $115^\circ, 140^\circ, 40^\circ$ (b) $40^\circ, 140^\circ, 115^\circ$
(c) $140^\circ, 40^\circ, 115^\circ$ (d) $115^\circ, 40^\circ, 140^\circ$

**61.** If some migratory birds travel as much as 15000 km to escape the extreme climatic conditions at home, then the distance in meters using scientific notation, is
(a) $1.5\times10^4$ m
(b) $1.5\times10^5$ m
(c) $1.5\times10^6$ m
(d) $1.5\times10^7$ m

**62.** 30 persons can reap a field in 17 days. How many more persons should be engaged to reap the same field in 10 days ?
(a) 17 (b) 30
(c) 51 (d) 21

**63.** A negative integer and a positive integer whose difference is +2, are
(a) −1, 3 (b) −2, 4 (c) −1, 1 (d) −4, 6

**64.** Six bells begin to toll together at the interval of 10 s, 15sec, 20sec, 25sec, 30sec, 35sec respectively , then how many times will they toll together in the span of 7 h ?
(a) 12 (b) 10 (c) 8 (d) 6

**65.** Difference of two perfect cubes is 189. If the cube root of the smaller of the two numbers is 3, the cube root of the larger number, is
(a) 27 (b) 36 (c) 9 (d) 6

# Part IV General Science

**66.** During dry weather while combing hair, sometimes we experience hair flying apart. The force responsible for this is
(a) force of gravity
(b) electrostatic force
(c) force of friction
(d) magnetic force

**67.** On heating one end of iron rod, other end also gets heated. Such materials are called
(a) good conductor of heat
(b) good insulator of heat
(c) bad conductor of heat
(d) heater

**68.** Which one records the distance travelled by a vehicle?
(a) Speedometer (b) Manometer
(c) Motometer (d) Odometer

**69.** The pressure exerted by liquid due to increase in depth
(a) reduces
(b) increases
(c) remains same
(d) depends on the nature of liquid

**70.** Which of the following is not always necessary to observe a shadow?
(a) Sun (b) Screen
(c) Source of light (d) Opaque object

**71.** The objects which partially allow the light to pass through it are called
(a) transparent (b) luminous
(c) opaque (d) translucent

**72.** Which of the following can never form a circular shadow?
(a) A ball (b) A flat disc
(c) A shoe box (d) An ice-cream cone

**73.** Bouncing back of ray of light from shining surface on which it was incident is known as
(a) refraction (b) bending
(c) reflection (d) dispersion

**74.** The normal range of vocal cords in women is
(a) 20 mm (b) 10 mm (c) 15mm (d) 40 mm

**75.** The loudness of sound is determined by its
(a) amplitude of vibration
(b) ratio of amplitude and frequence of vibration
(c) frequency of vibration
(d) product of amplitude and frequency of vibration

**76.** Pick the synthetic fibre out of the following.
(a) Cotton
(b) Nylon
(c) Jute
(d) Wool

**77.** Wool fibre cannot be obtained from which of the following?
(a) Goat
(b) Liama
(c) Alpaca
(d) Moth

**78.** Phenolphthalein is a synthetic indicator and its colours in acidic and basic solutions respectively are
(a) red and blue
(b) blue and red
(c) pink and colourless
(d) colourless and pink

**79.** Which of the following is not a common property of plastics?
(a) Non-reactive
(b) Light in weight
(c) Durable
(d) Good conductor of electricity

**80.** Choose the correct statement from the following.
(a) It is difficult to transport natural gas through pipes
(b) The disadvantage of natural gas is that it cannot be used directly for burning in homes
(c) Natural gas is stored under high pressure as compressed natural gas
(d) Natural gas cannot be used for power generation

**81.** If a person's clothes catch fire, the best way to extinguish the fire is to
(a) throw water on the clothes
(b) use fire extinguisher
(c) cover the person with a woolen blanket
(d) cover the person with a polythene sheet

**82.** Turmeric is a natural indicator. On adding its paste to acid and base separately, which colours would be observed?
(a) Yellow in both acid and base
(b) Yellow in acid and red in base
(c) Pink in acid and yellow in base
(d) Red in acid and blue in base

**83.** Which of the following is not a plastid?
(a) Chloroplast (b) Chromoplast
(c) Leucoplast (d) Ribosome

**84.** Which of these does not prevent growth of bacteria?
(a) Salt (b) Oil
(c) Sugar (d) Water

**85.** Potable water is the water which is
(a) obtained from a river
(b) obtained from a lake
(c) pure and fit for drinking
(d) used only for washing clothes

**86.** Scientist who discovered the fermentation
(a) Alexander Fleming
(b) Louis Pasteur
(c) Johann Mendel
(d) Charles Darwin

**87.** Given below is a list of edible plants.
(i) Banana (ii) Pumpkin
(iii) Lady finger (iv) Brinjal
Which pair of plants has two or more edible parts?
(a) (i) and (ii) (b) (ii) and (iii)
(c) (ii) and (iv) (d) (i) and (iv)

**88.** Cyanocobalamin is vitamin
(a) $B_{12}$ (b) $B_1$
(c) $B_2$ (d) K

**89.** Minerals and vitamins present in food are
(a) protective (b) energy giving
(c) body building (d) roughage

**90.** The most common carrier of communicable diseases is
(a) ant (b) housefly
(c) dragonfly (d) spider

**91.** Pathogenic microorganisms present in host cells are killed by medicines called
(a) pain killer
(b) antibodies
(c) antibiotics
(d) vaccines

**92.** Which of the following reproduces only inside a host cell?
(a) Bacteria (b) Virus
(c) Amoeba (d) Fungus

**93.** A disease in human beings caused by virus is
(a) typhoid (b) influenza
(c) dysentery (d) cholera

**94.** Carrot and radish food obtained from plants are examples of
(a) stem (b) roots
(c) leaves (d) flowers

**95.** Diseases occurring due to the deficiency of one or other nutrients is called
(a) dietary disease
(b) chronic disease
(c) deficiency disease
(d) transmitted disease

**96.** Carbohydrates can be tested by using which of the following?
(a) Iodine (b) Caustic soda
(c) Copper sulphate (d) Fehling's solution

**97.** The bread or idli dough rises because of
(a) heat (b) grinding
(c) growth of yeast cells (d) kneading

**98.** Read the food items gives below.
(i) Wheat (ii) Ghee
(iii) Iodised salt (iv) Spinach (palak)
Which of the above food items are energy giving foods?
(a) (i)and (iv) (b) (ii) and (iv)
(c) (i) and (ii) (d) (iii) and (iv)

**99.** The male parts of the flower are called
(a) pistils (b) carpels
(c) stamens (d) styles

**100.** The swollen part at the base of a flower from which the whorls of the flower radiate is called the
(a) thalamus (b) pedicel
(c) pistil (d) carpel

# Answers

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | (c) | 2 | (b) | 3 | (b) | 4 | (c) | 5 | (c) | 6 | (b) | 7 | (d) | 8 | (b) | 9 | (d) | 10 | (a) |
| 11 | (c) | 12 | (b) | 13 | (a) | 14 | (b) | 15 | (c) | 16 | (b) | 17 | (c) | 18 | (a) | 19 | (a) | 20 | (a) |
| 21 | (b) | 22 | (a) | 23 | (a) | 24 | (c) | 25 | (a) | 26 | (d) | 27 | (b) | 28 | (c) | 29 | (b) | 30 | (a) |
| 31 | (a) | 32 | (d) | 33 | (b) | 34 | (c) | 35 | (b) | 36 | (c) | 37 | (c) | 38 | (d) | 39 | (c) | 40 | (b) |
| 41 | (a) | 42 | (c) | 43 | (c) | 44 | (c) | 45 | (a) | 46 | (b) | 47 | (c) | 48 | (c) | 49 | (d) | 50 | (c) |
| 51 | (a) | 52 | (c) | 53 | (d) | 54 | (b) | 55 | (d) | 56 | (b) | 57 | (c) | 58 | (c) | 59 | (c) | 60 | (a) |
| 61 | (d) | 62 | (d) | 63 | (c) | 64 | (a) | 65 | (d) | 66 | (b) | 67 | (d) | 68 | (d) | 69 | (b) | 70 | (a) |
| 71 | (d) | 72 | (c) | 73 | (c) | 74 | (c) | 75 | (a) | 76 | (b) | 77 | (d) | 78 | (d) | 79 | (d) | 80 | (c) |
| 81 | (c) | 82 | (b) | 83 | (d) | 84 | (d) | 85 | (c) | 86 | (b) | 87 | (c) | 88 | (a) | 89 | (a) | 90 | (b) |
| 91 | (c) | 92 | (b) | 93 | (b) | 94 | (b) | 95 | (c) | 96 | (d) | 97 | (c) | 98 | (a) | 99 | (c) | 100 | (a) |

# Hints & Solutions

**31.** Let one angle be $x°$.

Therefore, other complement angle be $90° - x°$

[$\because$ sum of two complementary angles is 90°]

Given, difference of two complementary angles $= 12°$

$\therefore\ x° - (90° - x°) = 12°$

$\Rightarrow x° - 90° + x° = 12°$

$\Rightarrow 2x° = 12° + 90° \Rightarrow\ 2x° = 102°$

[on transposing $(-90°)$ from LHS to RHS]

On dividing both sides by 2, we get

$$\frac{2x°}{2} = \frac{102}{2} \quad \Rightarrow \quad x° = 51°$$

$\therefore$ One angle $= 51°$

and its complement angle $= 90° - 51° = 39°$

Hence, the required complementary angles are 51° and 39°.

**32.** We have, diameter $= 14$ cm

$$\therefore \text{ Radius } (r) = \frac{14}{2} = 7 \text{ cm}$$

$\therefore$ Surface area of a sphere $= 4\pi r^2$

$$= 4 \times \frac{22}{7} \times 7^2 = 4 \times 22 \times 7 = 616 \text{ cm}^2$$

**33.** Let the first even number be $x$.

Second consecutive even number $= x + 2$

and third consecutive even number

$= (x + 2) + 2 = x + 4$

So, as per the given condition, we have

$$x + x + 2 + x + 4 = 132$$

$\Rightarrow \quad 3x + 6 = 132$

$\Rightarrow \quad 3x = 132 - 6 \ \Rightarrow 3x = 126$

$$\Rightarrow \quad x = 126 \times \frac{1}{3} = 42$$

$\therefore$ Second number $= 42 + 2 = 44$

and third number $= 42 + 4 = 46$

So, the greatest number $= 46$

**34.** $84 - 2r - 2r^2 = -2(r^2 + r - 42)$

$= -2(r^2 + 7r - 6r - 42)$

$= -2[r(r + 7) - 6(r + 7)]$

$= -2(r - 6)(r + 7) = 2(6 - r)(r + 7)$

**35.** Given, $\dfrac{x^2 + y^2}{x^2 - y^2} = \dfrac{17}{8}$

On applying componendo and dividendo, we get

$$\frac{(x^2 + y^2) + (x^2 - y^2)}{(x^2 + y^2) - (x^2 - y^2)} = \frac{17 + 8}{17 - 8}$$

$$\Rightarrow \quad \frac{2x^2}{2y^2} = \frac{25}{9} \Rightarrow \frac{x^2}{y^2} = \left(\frac{5}{3}\right)^2$$

On taking square root both sides, we get

$$\frac{x}{y} = \frac{5}{3}$$

$$\therefore \quad x : y = 5 : 3$$

**36.** Here, greatest sector represent 40% of whole circle, so maximum number of people like Light music.

**37.** Total number of CD's $= 1000$

$\therefore$ Number of semi-classicial CD's = 20% of 1000

$$= \frac{20}{100} \times 1000 = 200$$

Number of folk music CD's = 30% of 1000

$$= \frac{30}{100} \times 1000 = 300$$

**38.** $\because \sqrt{24} = \sqrt{2\times2\times2\times3} = 2\sqrt{6}$

$$\sqrt{216} = \sqrt{3\times3\times3\times2\times2\times2} = 6\sqrt{6}$$

$$\sqrt{96} = \sqrt{2\times2\times2\times2\times2\times3} = 4\sqrt{6}$$

So, $\frac{2\sqrt{6}+6\sqrt{6}}{4\sqrt{6}} = \frac{\sqrt{6}(2+6)}{4\sqrt{6}} = \frac{8\sqrt{6}}{4\sqrt{6}} = \frac{8}{4} = 2$

**39.** Given, CP = ₹12000, SP = ₹8000

Loss = CP − SP = 12000 − 8000 = ₹4000

$\therefore$ Loss% $= \frac{\text{Loss}}{\text{Cost price}} \times 100$

$$= \frac{4000}{12000} \times 100 = \frac{100}{3}\% = 33\frac{1}{3}\%$$

**40.** $\because (3x + 2y)^2 = (3x)^2 + (2y)^2 + 2\times(3x)(2y)$

$$= 9x^2 + 4y^2 + 12xy$$

Similarly, $(3x - 2y)^2 = 9x^2 + 4y^2 - 12xy$

$\therefore$ $(3x + 2y)^2 + (3x - 2y)^2$

$= (9x^2 + 4y^2 + 12xy) + (9x^2 + 4y^2 - 12xy)$

$= 18x^2 + 8y^2$

**41.** Area covered by the grass = Area of the park left after cementing the path − Area of rectangular beds

$= 504\ m^2 - 2\times(1.5\times2)\ m^2 = 504\ m^2 - 6\ m^2$

$= 498\ m^2$

**42.** We have, $5^{3x-1} \div 25 = 125$

$\Rightarrow \quad 5^{3x-1} \times \frac{1}{25} = 125 \Rightarrow \frac{5^{3x}}{5} \times \frac{1}{5\times5} = 5\times5\times5$

$\Rightarrow \quad 5^{3x} \times \frac{1}{5^3} = 5^3$

$\Rightarrow \quad 5^{3x} = 5^3 \times 5^3 \Rightarrow 5^{3x} = 5^{3+3} = 5^6$

$\Rightarrow \quad 3x = 6$ [$\because$ bases are same]

$\Rightarrow \quad x = 6 \times \frac{1}{3} = 2$

**43.** If the speed of car remains constant.

Then, distance is directly proportional to time,

i.e. $d \propto t$

Here, $d_1 = 60$ km, $t_1 = 2$ and $d_2 = ?$, $t_2 = 6$

$\Rightarrow \quad \frac{d_1}{t_1} = \frac{d_2}{t_2}$ [$\because d$ = distance, $t$ = time]

$$\frac{60}{2} = \frac{d_2}{6}$$

$\therefore \quad d_2 = \frac{60\times6}{2} = 180$ km

So, 180 km travelled by the car in 6 h.

**44.** It is given that

$$x - \frac{1}{x} = 7 \qquad \ldots(i)$$

On squaring Eq.(i) both sides, we get

$$\left(x - \frac{1}{x}\right)^2 = (7)^2$$

$\Rightarrow \quad (x)^2 + \left(\frac{1}{x}\right)^2 - 2\times x\times\frac{1}{x} = 49$

[in LHS using identity, $(a-b)^2 = a^2 + b^2 - 2ab$]

$\Rightarrow \quad x^2 + \frac{1}{x^2} - 2 = 49 \Rightarrow x^2 + \frac{1}{x^2} = 49 + 2$

$\Rightarrow \quad x^2 + \frac{1}{x^2} = 51$

**45.** For a pair of integers whose product is –36 and whose difference = 15

So, first integer = – 3 and second integer = 12

Their product

$$= (-3)\times12 = -(3\times12) = -36$$

and the difference between these two integer is 15.

**46.** HCF of $\frac{12}{7}, \frac{18}{7}, \frac{24}{7} = \frac{\text{HCF }(12, 18, 24)}{\text{LCM }(7, 7, 7)} = \frac{6}{7}$

**47.** The prime factorisation of 5832

| | |
|---|---|
| 2 | 5832 |
| 2 | 2916 |
| 2 | 1458 |
| 3 | 729 |
| 3 | 243 |
| 3 | 81 |
| 3 | 27 |
| 3 | 9 |
| 3 | 3 |
| | 1 |

$5832 = \underline{2\times2\times2}\times\underline{3\times3\times3}\times\underline{3\times3\times3}$

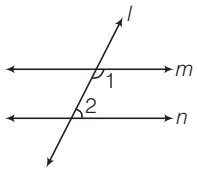
Therefore,

$\sqrt[3]{5832} = \sqrt{2\times2\times2\times3\times3\times3\times3\times3\times3}$

$2\times3\times3 = 18$

**48.** Let $l$ be a transversal intersecting two parallel lines $m$ and $n$.

Let $\angle 1 = 3x$ and $\angle 2 = 2x$




Also, $\angle 1 + \angle 2 = 180°$

$\Rightarrow \quad 3x + 2x = 180°$

$\Rightarrow \quad x = 36°$

$\therefore \quad \angle 1 = 3 \times 36° = 108°$

and $\quad \angle 2 = 2 \times 36° = 72°$

So, the greater of the two angles is 108°.

**49.** We have, $-5 + 2\sqrt{5} - \sqrt{5} = -5 + \sqrt{5}$

Here, – 5 is a rational number and $\sqrt{5}$ is an irrational number. We know that, the addition of a rational number and an irrational number is always an irrational number.

Thus, $(-5 + \sqrt{5})$ is an irrational number.

Hence, $(-5 + 2\sqrt{5} - \sqrt{5})$ is an irrational number.

**50.** Given, total surface area of the cube = 486 cm$^2$

But we know that, total surface area of cube

$= 6a^2 \quad [\because a = \text{edge of the cube}]$

$\therefore \quad 6a^2 = 486$

$\Rightarrow \quad a^2 = \dfrac{486}{6} = 81$

$\Rightarrow \quad a = \sqrt{81} = 9 \text{ cm}$

[on taking positive square root]

We know that, lateral surface area of cube

$= 4a^2 = 4(9)^2 = 4 \times 81 = 324 \text{ cm}^2$

**51.** In the given triangle, $\angle P = y$, $\angle Q = 40°$,

$\angle PRQ = 30°$, $\angle SRP = x$

We know that, the sum of all angles in a triangle is equal to 180°.

$\therefore \quad \angle PQR + \angle QPR + \angle PRQ = 180°$

$\Rightarrow \quad 40° + y + 30° = 180°$

$\Rightarrow \quad y = 180° - 70° = 110°$

Also, the sum of interior opposite angles is equal to exterior angle.

$\because \quad 40° + 110° = 150° = x$

$\Rightarrow \quad x = 150°$

Now, $2x = 2 \times 150°$

$\therefore \quad 2x = 300°$

**52.** We have, perimeter = 77 cm

$$(x + 1) + (x + 2) + (2x + 2) + (2x + 1) + (x + 1) = 77$$

$\Rightarrow \quad 7x + 7 = 77 \Rightarrow 7x = (77 - 7)$

$\Rightarrow \quad 7x = 70 \Rightarrow x = 70 \times \dfrac{1}{7} \Rightarrow x = 10$

Hence, the required value of $x$ is 10 cm.

**53.** Given, $p(x) = x^3 - 4x^2 + x + 6 \quad \ldots(i)$

Put $x = 3$ in Eq. (i), we get

$p(3) = (3)^3 - 4(3)^2 + 3 + 6$

$= 27 - 36 + 9 = 0$

**54.** Given, $a : b = 5 : 3$

$\therefore \quad \dfrac{a}{b} = \dfrac{5}{3}$

Now, $\dfrac{5a + 8b}{6a - 7b} = \dfrac{\frac{5a}{b} + \frac{8b}{b}}{\frac{6a}{b} - \frac{7b}{b}}$

[divided numerator and denominator by $b$]

$$= \frac{5 \times \frac{5}{3} + 8}{6 \times \frac{5}{3} - 7} = \frac{\frac{25}{3} + 8}{\frac{30}{3} - 7} = \frac{\frac{25 + 24}{3}}{\frac{30 - 21}{3}}$$

$$= \frac{\frac{49}{3}}{\frac{9}{3}} = \frac{49}{3} \times \frac{3}{9} = \frac{49}{9} \qquad \left[\because \frac{a}{b} = \frac{5}{3}\right]$$

$\therefore \quad (5a + 8b) : (6a - 7b) = 49 : 9$

**55.** Total number of sector = 3 green + 5 black + 10 red = 18

Number of non-black sectors i.e. number of green and red sectors = 3 + 10 = 13

$\therefore$ Probability of getting a non-black sector = $\dfrac{13}{18}$

**56.** Given that, $\sqrt{248 + \sqrt{52 + \sqrt{144}}}$

$= \sqrt{248 + \sqrt{52 + 12}} \qquad [\because 144 = (12)^2]$

$= \sqrt{248 + \sqrt{64}}$

$= \sqrt{248 + 8}$ $[\because 64 = (8)^2]$

$= \sqrt{256} = 16$

Hence, value of the expression is 16.

**57.** Here, principle $(P) = ₹48000$

Rate $(R) = 8\%$ per annum

Time $(n) = 1$ yr

when interest is compounded half-yearly, then

$$A = P\left(1 + \frac{R}{200}\right)^2 = 48000\left(1 + \frac{8}{200}\right)^2$$

$$= 48000 \times \frac{26}{25} \times \frac{26}{25} = 76.8 \times 26 \times 26$$

$= ₹\ 51916.80$

$\therefore$ Compound Interest (CI) $= A - P$

$= ₹\ (51916.80 - 48000) = ₹\ 3916.80$

**59.** According to the given figure,

Area of wall = Length × Breadth

$= (5x + 2) \times 5x$

$= 5x \times 5x + 5x \times 2$

$= 25x^2 + 10x$ sq unit

Area of window $= 2x \times x = 2x^2$ sq unit

and area of door $= 3x \times x = 3x^2$ sq unit

Now, total area of window and door

$= 2x^2 + 3x^2$

$= 5x^2$ sq unit

Thus, remaining area of wall to be painted

$= (25x^2 + 10x) - (5x^2)$

$= 25x^2 + 10x - 5x^2$

$= 20x^2 + 10x$

$= 10x\,(2x + 1)$ sq unit

**60.** $\angle y + 40° = 180°$ [by linear pair]

$\Rightarrow$ $\angle y = 180° - 40°$

$\Rightarrow$ $\angle y = 140°$

$\angle z = 40°$ [vertically opposite angles]

$\because \angle x + 25° + \angle z = 180°$ [by linear pair]

$\angle x + 25° + 40° = 180°$

$\angle x = 180° - 65° = 115°$

Hence, $\angle x = 115°$, $\angle y = 140°$

and $\angle z = 40°$

**61.** Given, birds travel $= 15000$ km

So, $15000$ km $= 15000 \times 1000$ m

$[\because 1$ km $= 1000$ m$]$

$= 15 \times 10^3 \times 10^3$ m

In scientific notation $= 15 \times 10^6$ m

$[\because a^m \times a^n = a^{m+n}]$

$= 1.5 \times 10^7$ m

So, birds travel $1.5 \times 10^7$ m.

**62.** Since, more persons can reap a field in lesser days.

Hence, number of persons and number of days to reap a field are in inverse proportion.

Let number of persons $= n$ and number of days $= d$.

Here, $n_1 = 30$, $d_1 = 17$, $d_2 = 10$ and $n_2 = ?$

In case of inverse proportion,

$n_1 d_1 = n_2 d_2$

$\Rightarrow$ $30 \times 17 = n_2 \times 10$

$\Rightarrow$ $n_2 = \frac{30 \times 17}{10} = 51$

Hence, number of more persons which should be engaged $= 51 - 30 = 21$

**63.** For a negative integer and a positive integer whose difference is +2

First integer $= 1$

and second integer $= -1$

$\therefore$ $1 - (-1) = 1 + 1 = 2$

**64.** We have to find the LCM of 10, 15, 20, 25, 30, 35

| | |
|---|---|
| 2 | 10, 15, 20, 25, 30, 35 |
| 2 | 5, 15, 10, 25, 15, 35 |
| 3 | 5, 15, 5, 25, 15, 35 |
| 5 | 5, 5, 5, 25, 5, 35 |
| 5 | 1, 1, 1, 5, 1, 7 |
| 7 | 1, 1, 1, 1, 1, 7 |
| | 1, 1, 1, 1, 1, 1 |

$\therefore$ LCM $= 2 \times 2 \times 3 \times 5 \times 5 \times 7 = 2100$

In 7 hour ($7 \times 3600$ sec), then the ring will toll together, $= \frac{7 \times 3600}{2100} = 12$ times