ARMY PUBLIC SCHOOL, AHMEDNAGAR

CHAPTER 8: COMPARING QUANTITIES

CLASS: VII

SUBJECT: MATHEMATICS

QUESTION BANK

Multiple Choice Questions (MCQs)

In questions 1 to 15, choose the correct option.

Question 1. Gayatri's income is ₹ 1,60,000 per year. She pays 15% of this as house rent and 10% of the remainder on her child's education. The money left with her is

(a) ₹ 136000   (b) ₹ 120000   (c) ₹ 122400   (d) ₹ 14000

Question 2. The ratio of Fatima's income to her savings is 4 : 1. The percentage of money saved by her

(a) 20%   (b) 25%   (c) 40%   (d) 80%

Question 3. In a scout camp, 40% of the scouts were from Gujarat State and 20% of these were from Ahmedabad. The percentage of scouts in the camp from Ahmedabad is

(a) 25   (b) 32.5   (c) 8   (d) 50

Question 4. A bicycle is purchased for ₹ 1800 and is sold at a profit of 12%. Its selling price is

(a) ₹ 1584   (b) ₹ 2016   (c) ₹ 1788   (d) ₹ 1812

Question 5. A cricket bat was purchased for ₹ 800 and was sold for ₹ 1600. Then profit earned is

(a) 100%   (b) 64%   (c) 50%   (d) 60%

Question 6. A farmer bought a buffalo for ₹ 44000 and a cow for ₹ 18000. He sold the buffalo at a loss of 5% but made a profit of 10% on the cow. The net result of the transaction is

(a) loss of ₹ 200   (b) profit of ₹ 400   (c) loss of ₹ 400   (d) profit of ₹ 200

Question 7. If Mohan's income is 25% more than Raman's income, then Raman's income is less than Mohan's income by

(a) 25%   (b) 80%   (c) 20%   (d) 75%

Question 8. The interest on ₹ 30000 for 3 years at the rate of 15% per annum is

(a) ₹ 4500   (b) ₹ 9000   (c) ₹ 18000   (d) ₹ 13500

Question 9. Amount received on ₹ 3000 for 2 years at the rate of 11% per annum is

(a) ₹ 2340   (b) ₹ 3660   (c) ₹ 4320   (d) ₹ 3330

Question 10. Interest on ₹ 12000 for 1 month at the rate of 10% per annum is

(a) ₹ 1200   (b) ₹ 600   (c) ₹ 100   (d) ₹ 12100

Question 11. Rajni and Mohini deposited ₹ 3000 and ₹ 4000 in a company at the rate of 10% per annum for 3 years and $2_{1/2}$ years respectively. The difference of the amounts received by them will be

(a) ₹ 100   (b) ₹ 1000   (c) ₹ 900   (d) ₹ 1100

Question 12. If 90% of x is 315 km, then the value of x is

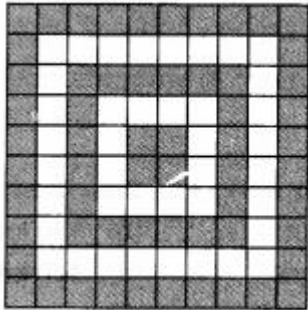(a) 325 km   (b) 350 km   (c) 405 km   (d) 340 km

Question 13. On selling an article for ₹ 329, a dealer lost 6%. The cost price of the article is

(a) ₹ 310.37   (b) ₹ 348.74   (c) ₹ 335   (d) ₹ 350

Question 14. The sum which will earn a simple interest of ₹ 126 in 2 years at 14% per annum is

(a) ₹ 394   (b) ₹ 395   (c)₹ 3450   (d) ₹ 540

Question 15. The percent that represents the unshaded region in the figure.

(a) 75%   (b) 50%   (c) 40%   (d) 60%

Fill in the Blank

In questions 1 to 20, fill in the blanks to make the statements True .

Question 1. 15 kg is _____ % of 50 kg.

Question 2. Weight of Nikhii increased from 60 kg to 66 kg. Then, the increase in weight is _____ %

Question 3. In a class of 50 students, 8 % were absent on one day. The number of students present on that day was _____

Question 4. Savitri obtained 440 marks out of 500 in an examination. She secured _____% marks in the examination.

Question 5. Out of a total deposit of ₹ 1500 in her bank account, Abida withdrew 40% of the deposit. Now the balance in her account is _____

Question 6. _____ is 50% more than 60.

Question 7. John sells a bat for ₹ 75 and suffers a loss of ₹ 8. The cost price of the bat is _____

Question 8. If the price of sugar is decreased by 20%, then the new price of 3 kg sugar originally costing ₹ 120 will be _____

Question 9. Mohini bought a cow for ₹ 9000 and sold it at a loss of ₹ 900. The selling price of the cow is _____

Question 10. Devangi buys a chair for ₹ 700 and sells it for ₹ 750. She earns a profit of _____ % _____in the transaction.

Question 11. Sonal bought a bed sheet for ₹ 400 and sold it for ₹ 440. Her_____% is _____

Question 12. Nasim bought a pen for ₹ 60 and sold it for ₹ 54. His _____ % is _____

Question 13. Aahuti purchased a house for ₹ 50,59,700 and spent ₹ 40300 on its repairs. To make a profit of 5%, she should sell the house for ₹ _____

Question 14. If 20 lemons are bought for ₹ 10 and sold at 5 for three rupees, then _____ in the transaction is _____%

Question 15. Narain bought 120 oranges at ₹ 4 each. He sold 60% of the oranges at 5 each and the remaining at ₹ 3.50 each. His _____ is _____ %

Question 16. A fruit seller purchased 20 kg of apples at ₹ 50 per kg. Out of these, 5% of the apples were found to be rotten. If he sells the remaining apples at ₹ 60 per kg, then his _____ is _____%

Question 17. Interest on ₹ 3000 at 10% per annum for a period of 3 years is _____

Question 18. Amount obtained by depositing ₹ 20,000 at 8% per annum for six months is _____

Question 19. Interest on ₹ 12500 at 18% per annum for a period of 2 years and 4 months is

Question 20. If A is increased by 20%, it equals B. If B is decreased by 50%, it equals C. Then _____% of A is equal to C.

True/ False

In questions 1 to 10, state whether the given statements are True or False.

Question 1. A vendor purchased ₹ 120 lemons at 120 per hundred. 10% of the lemons were found rotten which he sold at ₹ 50 per hundred. If he sells the remaining lemons at ₹ 125 per hundred, then his profit will be 16%.

Question 2. If Ankita obtains 336 marks out of 600, then the percentage of marks obtained by her is 33.6.

Question 3. Out of 600 students of a school, 126 go for a picnic. The percentage of students that did not go for the picnic is 75.

Question 4. By selling a book for ₹ 50, a shopkeeper suffers a loss of 10%. The cost price of the book is ₹ 60.

Question 5. If a chair is bought for ₹ 2000 and is sold at a gain of 10%, then the selling price of the chair is ₹ 2010.

Question 6. If a bicycle was bought for ₹ 650 and sold for ₹ 585, then the percentage of profit is 10.

Question 7. Sushma sold her watch for ₹ 3320 at a gain of ₹ 320. For earning a gain of 10% she should have sold the watch for ₹ 3300

Question 8. Interest on ₹ 1200 for $1\frac{1}{2}$ years at the rate of 15% per annum is ₹ 180.

Question 9. The amount received after depositing ₹ 800 for a period of 3 years at the rate of 12% per annum is ₹ 896.

Question 10. ₹ 6400 were lent to Feroz and Rashmi at 15% per annum for $3\frac{1}{2}$ and 5 years respectively. The difference in the interest paid by them is ₹ 150.

In questions 1 to 24, answer the following questions:

SHORT ANSWER TYPE QUESTIONS:

Question 1. Imagine that a 10 × 10 grid has value 300 and that this value is divided evenly among the small squares. In other words, each small square is worth 3. Use a new grid for each part of this problem, and label each grid "Value: 300".
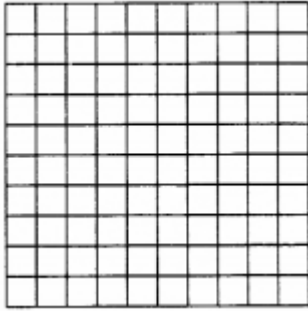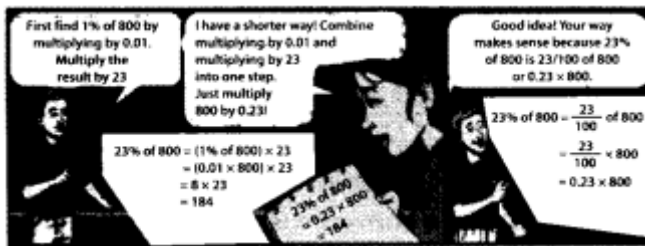
(a) Shade 25% of the grid. What is 25% of 300? Compare the two answers.

(b) What is the value of 25 squares?

(c) Shade 17% of the grid. What is 17% of 300? Compare the two answers.

(d) What is the value of 1/10 of the grid?

Question 2. Sachin and Sanjana are calculating 23% of 800.

Now calculate 52% of 700 using both the ways described above. Which way do you find easier?

Question 3. 45% of the population of a town are men and 40% are women. What is the percentage of children?

Question 4. The strength of a school is 2000. If 40% of the students are girls then how many boys are there in the school?

Question 5. Chalk contains 10% calcium, 3% carbon and 12% oxygen. Find the amount of carbon and calcium (in grams) in $2\frac{1}{2}$ kg of chalk.

Question 6. 800 kg of mortar consists of 55% sand, 33% cement and rest lime. What is the mass of lime in mortar?

Question 7. In a furniture shop, 24 tables were bought at the rate of ₹ 450 per table. The shopkeeper sold 16 of them at the rate of ₹ 600 per table and the remaining at the rate of ₹ 400 per table. Find her gain or loss percent.

Question 8. Medha deposited 20% of her money in a bank. After spending 20% of the remainder, she has ₹ 4800 left with her. How much did she originally have?

Question 9. The cost of a flower vase increased by 12%. If the current cost is ₹ 896, what was its original cost?

Question 10. Radhika borrowed ₹ 12000 from her friends. Out of which ₹ 4000 were borrowed at 18% and the remaining at 15% rate of interest per annum. What is the total interest after 3 years?

Question 11. A man travelled 60 km by car and 240 km by train. Find what percent of the total journey he travels by car and what percent by train?

Question 12. By selling a chair for ₹ 1440, a shopkeeper loses 10%. At what price did he buy it?

Question 13. Dhruvika invested money for a period from May 2006 to April 2008 at a rate of 12% per annum. If interest received by her is ₹ 1620, find the money invested.

Question 14. A person wanted to sell a scooter at a loss of 25%. But at the last moment he changed his mind and sold the scooter at a loss of 20%. If the difference in the two SP's is ₹ 4000, then find the CP of the scooter.

Question 15. The population of a village is 8000. Out of these, 80% are literate and of these literate people, 40% are women. Find the ratio of the number of literate women to the total population.

Question 16. In an entertainment programme, 250 tickets of ₹ 400 and 500 tickets of ₹ 100 were sold. If the entertainment tax is 40% on a ticket of ₹ 400 and 20% on a ticket of ₹ 100, find how much entertainment tax was collected from the programme.

Question 17. Bhavya earns ₹ 50,000 per month and spends 80% of it. Due to pay revision, her monthly income increases by 20% but due to price rise, she has to spend 20% more. Find her new savings.

Question 18. In an examination, there are three papers each of 100 marks. A candidate obtained 53 marks in the first and 75 marks in the second paper. How many marks must the candidate obtain in the third paper to get an overall of 70 percent marks?

LONG ANSWER TYPE QUESTIONS:

Question 19. Health Application:

A doctor reports blood pressure in millimeters of mercury (mm Hg) as a ratio of systolic blood pressure to diastolic blood pressure (such as 140 over 80). Systolic pressure is measured when the heart beats, and diastolic pressure is measured when it rests. Refer to the table of blood pressure ranges for adults.

Blood Pressure Ranges			
	Normal	**Prehypertension**	**Hypertension (Very High)**
Systolic	Under 120 mm Hg	120-139 mm Hg	140 mm Hg and above
Diastolic	Under 80 mm Hg	80-89 mm Hg	90 mm Hg and above

Manohar is a healthy 37 years old man whose blood pressure is in the normal category.

(a) Calculate an approximate ratio of systolic to diastolic blood pressures in the normal range.

(b) If Manohar's systolic blood pressure is 102 mm Hg, use the ratio from part (a) to predict his diastolic blood pressure.

(c) Calculate ratio of average systolic to average diastolic blood pressure in the prehypertension category.

Question 20. (a) Science Application:

The king cobra can reach a length of 558 cm. This is only about 60 per cent of the length of the largest reticulated python. Find the length of the largest reticulated python.

(b) Physical Science Application:

Unequal masses will not balance on a fulcrum if they are at equal distance from it; one side will go up and the other side will go down. Unequal masses will balance when the following proportion is true:

$$\frac{mass\ 1}{length\ 2} = \frac{mass\ 2}{length\ 1}$$
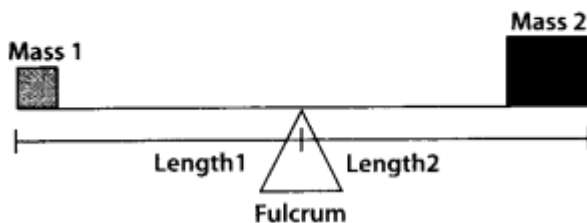
Two children can be balanced on a Seesaw when   mass 1/ length 2 = mass 2/ length 1

 The child on the left and child on the right are balanced. What is the mass of the child on the right?
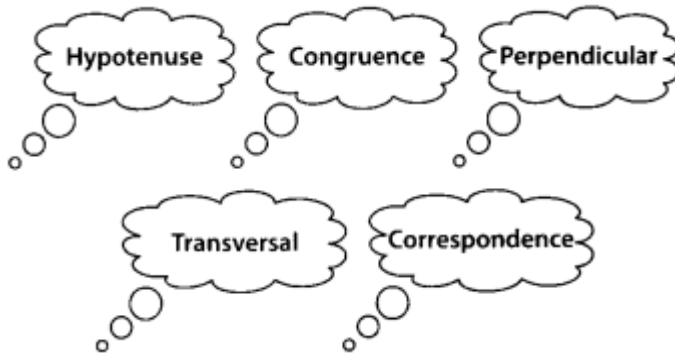

(c) Life Science Application:

A DNA model was built using the scale 2 cm : 0.0000001 mm. If the model of the DNA chain is 17 cm long, what is the length of the actual chain?

Question 21. Language Application:

Below are a few Mathematical terms.

Find

(a) The ratio of consonants to vowels in each of the terms.

(b) The percentage of consonants in each of the terms.

(COMPETENCY BASED QUESTION)

Question 22. What's the Error? An analysis showed that 0.06 per cent of the T-shirts made by one company were defective. A student says this is 6 out of every 100. What is the student's error?

Question 23. What's the Error? A student said that the ratios 34 and 916 were proportional. What error did the student make?

Question 24. What's the Error? A clothing store charges ₹ 1024 for 4 T-shirts. A student says that the unit price is ₹ 25.6 per T-shirt. What is the error? What is the correct unit price?

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CLASS: VII   **SUBJECT: MATHS**
CHAPTER- ALGEBRAIC EXPRESSIONS

MCQ

1. Which of the following pairs of terms is a pair of like terms?
   (a) 7p, 8q
   (b) 10pq, -7qp
   (c) $12q^2 p^2$, $-5p^2$
   (d) 2405p, 78qp

2. Add 2 mn, -4 mn, 8 mn, -6 mn
   (a) 0
   (b) 2 mn
   (c) 8 mn
   (d) 10 mn

3. Which of the following pairs of terms is a pair of like terms?
   (a) 1, 10
   (b) y, -xy
   (c) z^2, Z
   (d) Z^2, 8

4. What is the coefficient of x in the expression $ax^3 + bx^2 + d$?
   (a) a
   (b) b
   (c) d
   (d) 0

5. Simplify : p + (p – q) + q + (q – p)
   (a) p
   (b) q
   (c) p + q
   (d) p – q

6. Subtract – xy from xy
   (a) xy
   (b) 2xy
   (c) 3xy
   (d) 4xy

7. What should be added to $x^2 + y^2$ to get $x^2 + y^2 + 2$ xy?
   (a) xy
   (b) 2xy
   (c) 4xy
   (d) -2xy

8. Find the value of the expression 5n – 3 for n = -1
   (a) 5
   (b) -3
   (c) -8
   (d) 8

9. Find the value of the expression 3x + 5 (x – 2) for x = 2
   (a) 2
   (b) 4
   (c) 5
   (d) 6

10. Write expressions sum of numbers of x and y subtracted from their product?
   (a) (x × y) – (x + y)
   (b) (x + y) – x/y
   (c) x/y – xy
   (d) x + y – x

11. Simplify $(3x^2 + 6y – 8) – (8y + x^2 – 6)$
   (a) $3y^2 + 2y + 1$
   (b) $2x^2 – 2y – 2$

(c) $2x^2 - 1$ (d) $4x^2 - 2y + 1$

12. Find the value if a = 2 and b = 3 in $3a^2 + 4b^2 - 4$
   (a) 44   **(b) 48**
   (c)   **(d) 46**

13. Find the value of expression $15n^2 + 5n - 3$ for n = 2
   (a) 63   **(b) 62**
   (c) 67   **(d) 69**

14. A _____ can take various values
   (a) Term   (b) variable
   (c) Expression   (d) None of these

15. An expression which contains two unlike term ………………
   (a) monomial   (b) trinomial
   (c) binomial   (d) None of these
16. In (-x) coefficient of x is …………
   (a) –x   (b) x
   (c) 1   (d) -1
17. The degree of the polynomial $5x^3 - 3x^2 + 6x^4 + 7$ ……………….

   (a) 3   (b) 4

   (c) 2   (d) 1

18. The degree of 1 is ………………

   (a) 1   (b) 0

   (c) -1   (d) None of these

19. We get ……………….. when $(x - 2x^2)$ is subtracted from 1.

   (a) $1 - x + 2x^2$ (b) $x + 2x^2 -1$

   (c) $2x^2 -x -1$ (d) None of these

20. The value of the expression $5x^3 - 2x + 3$ when x = − 2 is _____

   (a) 33   (b) -33

   (c) 40   (d) -40

Short Question

21. Classify the following into monomials, binomial and trinomials.

(i) -6
(ii) -5 + x

(iii) $32x - y$
(iv) $6x^2 + 5x - 3$
(v) $z^2 + 2$

22. Add:
(i) $3x^2y$, $-5x^2y$, $-x^2y$
(ii) $a + b - 3$, $b + 2a - 1$

23. Simplify combining the like terms:
(i) $a - (a - b) - b - (b - a)$
(ii) $x^2 - 3x + y^2 - x - 2y^2$

24. Subtract $24xy - 10y - 18x$ from $30xy + 12y - 14x$.

25. Group the like terms together from the following expressions:
$-8x^2y$, $3x$, $4y$, $-32x$, $2x^2y$, $-y$

Long Questions

26. From the sum of $2x^2 + 3xy - 5$ and $7 + 2xy - x^2$ subtract $3xy + x^2 - 2$.

27. Subtract $3x^2 - 5y - 2$ from $5y - 3x^2 + xy$ and find the value of the result if $x = 2$, $y = -1$.

28. Find the value of t if the value of $3x^2 + 5x - 2t$ equals to 8, when $x = -1$.
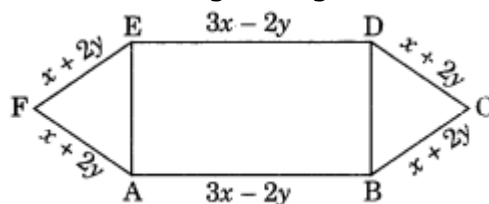
29. What should be subtracted from $2x^3 - 3x^2y + 2xy^2 + 3y^2$ to get $x^3 - 2x^2y + 3xy^2 + 4y^2$?

30. To what expression must $99x^3 - 33x^2 - 13x - 41$ be added to make the sum zero?

Value Based Question

31. Rohan's mother gave him ₹ $3xy^2$ and his father gave him ₹ $5(xy^2 + 2)$. Out of this total money he spent ₹ $(10 - 3xy^2)$ on his birthday party. How much money is left with him?

32. Find the perimeter of the given figure ABCDEF.

33. If $P = 2x^2 - 5x + 2$, $Q = 5x^2 + 6x - 3$ and $R = 3x^2 - x - 1$. Find the value of $2P - Q + 3R$.

34.Rashi bought an item for Rs $xy - 2xy^2$, Siya bought another item and paid Rs $2xy^2 + x^2$ more than Rashi. Find the amount paid by siya

35. A taxi Service charges Rs. 8 per km levies a fixed charge of Rs. 50. Write an algebraic expression for the above situation, if the taxi is hired for x km.

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ARMY PUBLIC SCHOOL, AHMEDNAGAR
QUESTIONS BANK
**CLASS: VII** **SUBJECT:**
MATHS
CHAPTER- PERIMETER AND AREA

MCQ

1. Area of a parallelogram =

   (a) base × height (b) $\frac{1}{2}$× base × height

   (c) $\frac{1}{3}$ × base × height (d) $\frac{1}{4}$ × base × height

2. $1 \text{ cm}^2 =$
   (a) 10 mm^2 (b) 100 mm^2
   (c) 1000 mm^2 (d) 10000 mm^2

3. 1 hectare =
   (a) 10 m^2 (b) 100 m^2
   (c) 1000 m^2 (d) 10000 m^2

4. The area of a square is 625 m^2. Find its side
   (a) 25 m (b) 50 m
   (c) 125 m (d) 5 m

5. The perimeter of a rectangle is 30 m. Its length is 10 m. Its breadth is
   (a) 5 m (b) 10 m
   (c) 15 m (d) 3 m

6. The area of a rectangular room is 150 m^2. If its breadth is 10 m, then find its length.
   (a) 15 m (b) 25 m
   (c) 50 m (d) 55 m

7. The area of a parallelogram of base 5 cm and height 3.2 cm is
   (a) 8 cm²   (b) 12 cm²
   (c) 16 cm²   (d) 20 cm²
8. Find AD in the following figure :
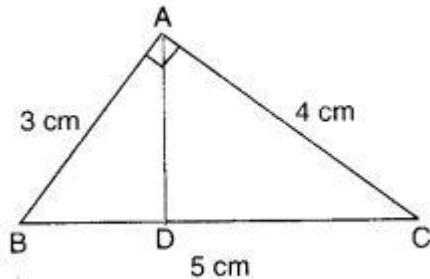
   (a) 3 cm   (b) 4 cm
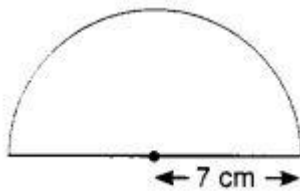   (c) 5 cm   (d) 2.4 cm
9. Which of the following is not the value of π ?
   (a) $\dfrac{22}{7}$ (b) $\dfrac{7}{22}$
   (c) $\dfrac{355}{113}$ (d) 3.14
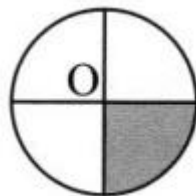10. The perimeter of the following figure is

   (a) 27 cm   (b) 28 cm
   (c) 36 cm   (d) 40 cm

11. The circumference of circle whose diameter is 14 cm will be:
   (a) 44 cm.   (b) 88 cm.

   (c) 44 cm².   (d) 88 cm²

12. If the area of circle is 44 cm², the area of shaded portion will be:

   (a) 11 cm²   (b) 11 cm
   (c) 22 cm²   (d) 22 cm²

13. The difference between the circumference and radius of a circle is 37 cm. The area of   the circle is:

(a) 111 cm²   (b) 184 cm²
(c) 154 cm²   (d) 259 cm²

14. The diameter of a wheel is 40 cm. How many revolutions will it make on covering 176 m?
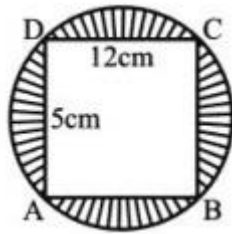(a) 140   (b) 150
(c) 160   (d) 166

15. A wire is in the shape of a square of side 10 cm. If the wire is rebend into a rectangle of length 12 cm, find its breadth.
(a) 12 cm   (b) 7 cm
(c) 8 cm   (d) 9 cm

Short Questions

16. Find the area of a circle whose circumference is 52.8 cm.

17. Find the area of the shaded region in the adjacent figure, take π = 3.14

18. The area of a square and a rectangle are equal. If the side of the square is 40 cm and the breadth of the rectangle is 25 cm, find the length of the rectangle.
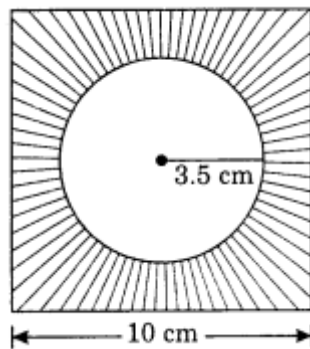
19. If the perimeter of a rectangle is 390 cm and the length is 30 cm. Find its breadth and the area.

20. The length of the diagonal of a square is 50 cm, find the perimeter of the square.
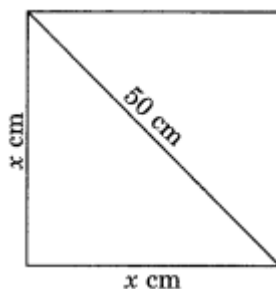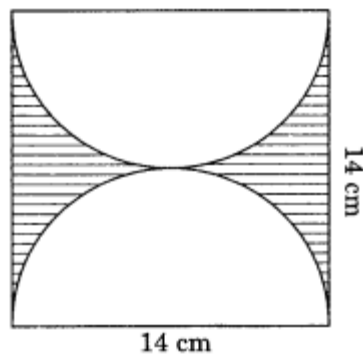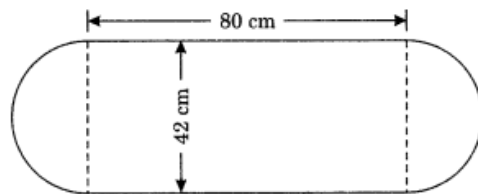

Long Question

21. In the given figure, find the area of the shaded portion.

22. Find the area of the shaded portion in the figure given below.

23. In the given figure, calculate:

(a) The area of the whole figure.

(b) The total length of the boundary of the field.

24. How many times a wheel of radius 28 cm must rotate to cover a distance of 352 m?

(Take $\pi = \dfrac{22}{7}$)

25. The area of a square park is the same as of a rectangular park. If the side of the square park is 60 m and the length of the rectangular park is 90 m, find the breadth of the rectangular park.

26. A door of length 2 m and breadth 1 m is fitted in a wall. The length of the wall is 4.5 m and the breadth is 3.6 m (Fig). Find the cost of white washing the wall, if the rate of white washing the wall is ₹ 20 per m².
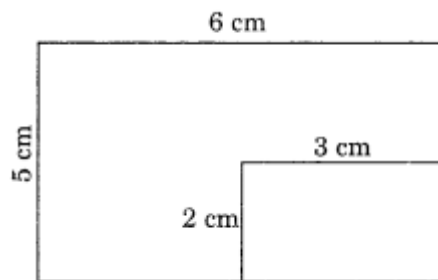
APPLICATION BASED QUESTION

27. In the given figure, ABCD is a square of side 14 cm. Find the area of the shaded region.
(Take п = 227)
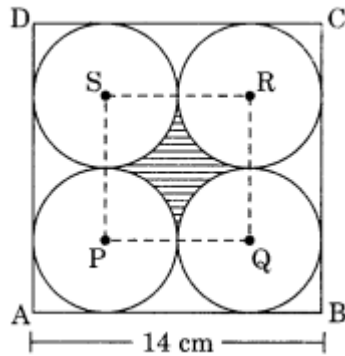
28. A rectangular piece of dimension 3 cm × 2 cm was cut from a rectangular sheet of paper of dimensions 6 cm × 5 cm. Find the ratio of the areas of the two rectangles.

29. Find the area of a parallelogram-shaped shaded region. Also, find the area of each triangle. What is the ratio of the area of shaded portion to the remaining area of the rectangle?
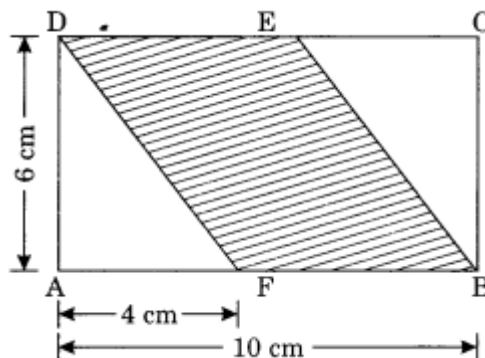
30. A nursery school playground is 160 m long and 80 m wide. In it 80 m × 80 m is kept for swings and in the remaining portion, there are 1.5 m wide path parallel to its width and parallel to its remaining length as shown in

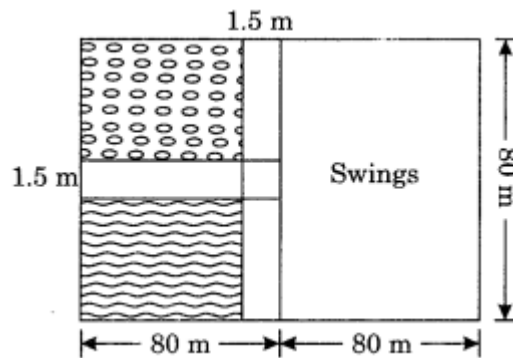Figure. The remaining area is covered by grass. Find the area covered by grass.

ARMY PUBLIC SCHOOL, AHMEDNAGAR

CHAPTER 13: EXPONENTS AND POWERS

CLASS: VII   SUBJECT: MATHS

QUESTION BANK

Multiple Choice Questions (MCQs)

In questions 1 to 18, choose the correct option.

Question 1: $[(-3)^2]^3$ is equal to

(a) $(-3)^8$ (b) $(-3)^6$

(c) $(-3)^5$ (d) $(-3)^{23}$

Question 2: For a non-zero rational number x, $x^8 \div x^2$ is equal to

(a) x^4 (b) x^6 (c) x^{10} (d) x^{16}

Question 3: x is a non-zero rational number. Product of the square of x with the cube of x is equal to the

(a) second power of x   (b) third power of x

(c) fifth power of x   (d) sixth power of x

Question 4: For any two non-zero rational numbers x and y, $x^5 \div y^5$ is equal to

(a) $(x \div y)^1$ (b) $(x \div y)^0$

(c) $(x \div y)^5$ (d) $(x \div y)^{10}$

Question 5: $(1° + 2° + 3°)$ is equal to

(a) 0   (b) 1   (c) 3   (d) 6

Question 6:

The value of $\dfrac{10^{22} + 10^{20}}{10^{20}}$ is

(a) 10   (b) 10^{42} (c) 101   (d) 10^{22}

Question 7: The standard form of the number 12345 is

(a) 1234.5×10^1 (b) 123.45×10^2

(c) 12.345×10^3 (d) 1.2345×10^4

Question 8:

If $2^{1998} - 2^{1997} - 2^{1996} + 2^{1995} = k \cdot 2^{1995}$, then the value of k is

(a) 1   (b) 2
(c) 3   (d) 4

Question 9: Which of the following is equal to 1?

(a) $2° + 3° + 4°$ (b) $2° \times 3° \times 4°$

(c) $(3° - 2°) \times 4°$ (d) $(3° - 2°) \times (3° + 2°)$

Question 10: In standard form, the number 72105.4 is written as 7.21054×10^n, where n is equal to

(a) 2   (b) 3   (c) 4   (d) 5

Question 11: The cube [-1/4] is

(a) $\dfrac{-1}{12}$ (b) $\dfrac{1}{16}$ (c) $\dfrac{-1}{64}$ (d) $\dfrac{1}{64}$

Question 12:

Which of the following is not equal to $\left(\dfrac{-5}{4}\right)^4$?

(a) $\dfrac{(-5)^4}{4^4}$ (b) $\dfrac{5^4}{(-4)^4}$

(c) $-\dfrac{5^4}{4^4}$ (d) $\left(-\dfrac{5}{4}\right) \times \left(-\dfrac{5}{4}\right) \times \left(-\dfrac{5}{4}\right) \times \left(-\dfrac{5}{4}\right)$

Question 13:

Which of the following is not equal to 1?

(a) $\dfrac{2^3 \times 3^2}{4 \times 18}$ (b) $[(-2)^3 \times (-2)^4] \div (-2)^7$

(c) $\dfrac{3^0 \times 5^3}{5 \times 25}$ (d) $\dfrac{2^4}{(7^0 + 3^0)^3}$

Question 14:

$\left(\dfrac{2}{3}\right)^3 \times \left(\dfrac{5}{7}\right)^3$ is equal to

(a) $\left(\dfrac{2}{3} \times \dfrac{5}{7}\right)^9$ (b) $\left(\dfrac{2}{3} \times \dfrac{5}{7}\right)^6$ (c) $\left(\dfrac{2}{3} \times \dfrac{5}{7}\right)^3$ (d) $\left(\dfrac{2}{3} \times \dfrac{5}{7}\right)^0$

Question 15:

Which of the following has the largest value?

(a) 0.0001

(b) $\dfrac{1}{10000}$

(c) $\dfrac{1}{10^6}$

(d) $\dfrac{1}{10^6}+0.1$

Question 16:

For non-zero numbers a and b, $\left(\dfrac{a}{b}\right)^m \div \left(\dfrac{a}{b}\right)^n$, where $m > n$, is equal to

(a) $\left(\dfrac{a}{b}\right)^{mn}$

(b) $\left(\dfrac{a}{b}\right)^{m+n}$

(c) $\left(\dfrac{a}{b}\right)^{m-n}$

(d) $\left(\left(\dfrac{a}{b}\right)^m\right)^n$

Question 17: Which of the following is not true?

(a) $3^2 > 2^3$ (b) $4^3 = 2^6$ (c) $3^3 = 9$ (d) $2^5 > 5^2$

Question 18: Which power of 8 is equal to 2^6?

(a) 3   (b) 2   (c) 1   (d) 4

Fill in the Blank

In questions 1 to 18, fill in the blanks to make the statements True .

Question 1:

$$(-2)^{31} \times (-2)^{13} = (-2)^{-}$$

Question 2:

$$(-3)^8 \div (-3)^5 = (-3)^{-}$$

Question 3:

$$\left(\dfrac{11}{15}\right)^4 \times (\underline{\hspace{1cm}})^5 = \left(\dfrac{11}{15}\right)^9$$

Question 4:

$$\left(\frac{-1}{4}\right)^3 \times \left(\frac{-1}{4}\right)^- = \left(\frac{-1}{4}\right)^{11}$$

Question 5:

$$\left[\left(\frac{7}{11}\right)^3\right]^4 = \left(\frac{7}{11}\right)^-$$

Question 6:

$$\left(\frac{6}{13}\right)^{10} \div \left[\left(\frac{6}{13}\right)^5\right]^2 = \left(\frac{6}{13}\right)^-$$

Question 7:

$$\left[\left(\frac{-1}{4}\right)^{16}\right]^2 = \left(\frac{-1}{4}\right)^-$$

Question 8:

$$\left(\frac{13}{14}\right)^5 \div (\_\_)^2 = \left(\frac{13}{14}\right)^3$$

Question 9: $a^6 \times a^5 \times a^\circ = a^{-}$

Question 10: 1 lakh = 10^{-}

Question 11: 1 million = 10^{-}

Question 12: 729 = 3^{-}

Question 13: 432 = $2^4 \times 3^{-}$

Question 14: $53700000 = \_\_\_ \times 10^7$

Question 15: $88880000000 = \_\_\_ \times 10^{10}$.

Question 16: $27500000 = 2.75 \times 10^{\_\_}$

Question 17: $340900000 = 3.409 \times 10^{\_\_}$

Question 18:

(a) 3^2 _____ 15

(c) 7^4 _____ 5^4

(e) 6^3 _____ 4^4

(b) 2^3 _____ 3^2

(d) 10000 _____ 10^5

True/ False

In questions 1 to 15, state whether the given statements are True or False.

Question 1: One million = 10^7

Question 2: One hour = 60^2 seconds

Question 3: $1^\circ \times 0^1 = 1$

Question 4: $(-3)^4 = -12$

Question 5: $3^4 > 4^3$

Question 6:

$$\left(\frac{-3}{5}\right)^{100} = \frac{-3^{100}}{-5^{100}}$$

Question 7: $(10 + 10)^{10} = 10^{10} + 10^{10}$

Question 8: $x^\circ \times x^\circ = x^\circ + x^\circ$ is true for all non-zero values of x.

Question 9: 4^9 is greater than 16^3.

Question 10: 4^2 is greater than 2^4.

Question 11:

$$\left(\frac{5}{8}\right)^9 \div \left(\frac{5}{8}\right)^4 = \left(\frac{5}{8}\right)^4$$

Question 12:

$$\left(\frac{7}{3}\right)^2 \times \left(\frac{7}{3}\right)^5 = \left(\frac{7}{3}\right)^{10}$$

Question 13: $5° \times 25° \times 125° = (50)6$

Question 14: $4 \times 10^5 + 3 \times 10^4 + 2 \times 10^3 + 1 \times 10° = 432010$

Question 15: $876543 = 8 \times 10^5 + 7 \times 10^4 + 6 \times 10^3 + 5 \times 10^2 + 4 \times 10^1 + 3 \times 10°$

In questions 1 to 30, answer the following questions:

Very Short Answer Type Questions

Question 1: Arrange in ascending order.

2^5, 3^3, $2^3 \times 2$, $(3^3)^2$, 3^5, $4°$, $2^3 \times 3^1$

Question 2: Arrange the following exponents in descending order. 2^{2+3} , $(2^2)^3$, (2×2^2) , $3^5/3^2$, $(3^2 \times 3^0)$, $(2^2 \times 5^2)$.

Question 3: By what number should $(-4)^5$ be divided so that the quotient may be equal to $(-4)^3$?

Question 4:

Find m, so that $\left(\dfrac{2}{9}\right)^3 \times \left(\dfrac{2}{9}\right)^6 = \left(\dfrac{2}{9}\right)^{2m-1}$.

Question 5:

If $\dfrac{p}{q} = \left(\dfrac{3}{2}\right)^2 \div \left(\dfrac{9}{4}\right)^0$, find the value of $\left(\dfrac{p}{q}\right)^3$.

Question 6:

Find the reciprocal of the rational number $\left(\dfrac{1}{2}\right)^2 \div \left(\dfrac{2}{3}\right)^3$.

Question 7: Find the value of

(a) 7^0

(b) $7^7 \div 7^7$

(c) $(-7)^{2 \times 7 - 6 - 8}$

(d) $(2^0 + 3^0 + 4^0)(4^0 - 3^0 - 2^0)$

(e) $2 \times 3 \times 4 \div 2^0 \times 3^0 \times 4^0$

(f) $(8^0 - 2^0) \times (8^0 + 2^0)$

Question 8:

Find the value of n, where n is an integer and $2^{n-5} \times 6^{2n-4} = \dfrac{1}{12^4 \times 2}$.

Question 9: Express the following in usual form.

(a) 8.01 x 10⁷   (b) 1.75 x 10⁻³

Question 10: Find the value of

(a) 2₅   (b)(-3₅)   (c) − (- 4₄)

Question 11: Express the following in exponential form.

(a) $3 \times 3 \times 3 \times a \times a \times a \times a$ (b) $a \times a \times b \times b \times b \times c \times c \times c \times c$

(c) $s \times s \times t \times t \times s \times s \times t$

Short Answer Type Questions

Question 12: How many times of 30 must be added together to get a sum equal to 30^7.

Question 13: Express each of the following numbers using exponential notations,

(a) 1024   (b) 1029   (c) $\dfrac{144}{875}$

Question 14: Identify the greater number, in each of the following.

(a) 2^6 or 6^2 (b) 2^9 or 9^2 (c) 7.9×10^4 or 5.28×10^5

Question 15: Express each of following as a product of powers of their prime factors,

(a) 9000   (b) 2025   (c) 800

Question 16: Express each of the following in single exponential form,

(a) $2^3 \times 3^3$

(b) $5^2 \times 7^2$

(c) $(-3)^3 \times (-10)^3$

(d) $(-11)^2 \times (-2)^2$

Question 17: Express the following numbers in standard form.

(a) 76,47,000   (b) 8,19,00,000

(c) 5,83,00,00,00,000   (d) 24 billion

Long Answer Type Questions

Question 18: The speed of light in vacuum is 3×10^8 m/s. Sunlight takes about 8 minutes to reach the Earth. Express distance of Sun from Earth in standard form.

Question 19: Simplify and express each of the following in exponential form.

(a) $\left[\left(\dfrac{3}{7}\right)^4 \times \left(\dfrac{3}{7}\right)^5\right] \div \left(\dfrac{3}{7}\right)^7$

(b) $\left[\left(\dfrac{7}{11}\right)^5 \div \left(\dfrac{7}{11}\right)^2\right] \times \left(\dfrac{7}{11}\right)^2$

(c) $(3^7 \div 3^5)^4$

(d) $\left(\dfrac{a^6}{a^4}\right) \times a^5 \times a^0$

(e) $\left[\left(\dfrac{3}{5}\right)^3 \times \left(\dfrac{3}{5}\right)^8\right] \div \left[\left(\dfrac{3}{5}\right)^2 \times \left(\dfrac{3}{5}\right)^4\right]$

(f) $(5^{15} \div 5^{10}) \times 5^5$

Question 20: Evaluate

(a) $\dfrac{7^8 \times a^{10} b^7 c^{12}}{7^6 \times a^8 b^4 c^{12}}$

(b) $\dfrac{5^4 \times 7^4 \times 2^7}{8 \times 49 \times 5^3}$

(c) $\dfrac{125 \times 5^2 \times a^7}{10^3 \times a^4}$

(d) $\dfrac{3^4 \times 12^3 \times 36}{2^5 \times 6^3}$

(e) $\left(\dfrac{6 \times 10}{2^2 \times 5^3}\right)^2 \times \dfrac{25}{27}$

(f) $\dfrac{15^4 \times 18^3}{3^3 \times 5^2 \times 12^2}$

(g) $\dfrac{6^4 \times 9^2 \times 25^3}{3^2 \times 4^2 \times 15^6}$

Question 21: Express the given information in Scientific notation (standard form) and then arrange them in ascending order of their size.

S. N.	Deserts of the World	Area (in sq km)
1.	Kalahari, South Africa	932,400
2.	Thar, India	199,430
3.	Gibson, Australia	155,400
4.	Great Victoria, Australia	647,500
5	Sahara, North Africa	8,598,800

Question 22: Express the given information in scientific notation and then arrange them in descending order of their size.

S. N.	Name of the planet	Mass (in kg)
1.	Mercury	330000000000000000000000
2.	Venus	4870000000000000000000000
3.	Earth	5980000000000000000000000
4.	Mars	642000000000000000000000
5.	Jupiter	1900000000000000000000000000
6.	Saturn	569000000000000000000000000
7.	Uranus	86900000000000000000000000
8.	Neptune	102000000000000000000000000
9.	Pluto	13100000000000000000000

Question 23: Write the number of seconds in scientific notation.

S. N.	Unit	Value in seconds
1.	1 minute	60
2.	1 hour	3,600
3.	1 day	86,400
4.	1 month	2,600,000
5.	1 year	32,000,000
6.	10 years	3,20,000,000

Question 24: On our own planet Earth, 361,419,000 square kilometers of area is covered with water and 148,647,000 square kilometers of area is covered by land. Find the approximate ratio of area covered with water to area covered by land converting these numbers into scientific notation.
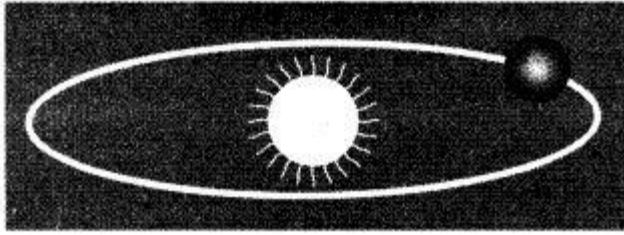
(APPLICATION BASED QUESTION)

Question 25: A light year is the distance that light can travel in one year.

1 light year = 9,460,000,000,000 km.

(a) Express one light year in scientific notation.

(b) The average distance between Earth and Sun is 1.496 x 10^8 km. Is the distance between Earth and the Sun greater than, less than or equal to one light year?
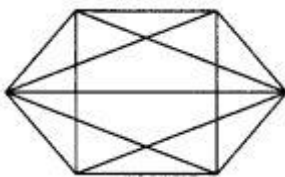
Question 26: Geometry Application   **(APPLICATION BASED QUESTION)**

The number of diagonals of an n-sided figure is $\frac{1}{2}(n^2 - 3n)$. Use the formula to find the number of diagonals for a 6-sided figure (hexagon).

Question 27: Life Science   **(APPLICATION BASED QUESTION)**

Bacteria can divide in every 20 minutes. So, 1 bacterium can multiply to 2 in 20 minutes, 4 in 40 minutes, and so on. How many bacteria will there be in 6 hours? Write your answer using exponents, then evaluate.

Most Bacteria reproduce by a type of simple cell division known as binary fission.

Each species reproduces best at a specific temperature and moisture level.

Question 28: Blubber makes up 27 percent of a blue whale's body weight. Deepak found the average weight of blue whales and used it to calculate the average weight of their blubber. He wrote the amount as 2^2 x 3^2 x 5 x 17 kg. Evaluate this amount.

Question 29: Life Science Application   **(APPLICATION BASED QUESTION)**

The major components of human blood are red blood cells, white blood cells, platelets and plasma. A typical red blood cell has a diameter of approx 7×10^{-6} metre. A typical platelet has a diameter of approximately 2.33×10^{-6} metre.

Which has a greater diameter, a red blood cell or a platelet?

Question 30: What's the Error? A student said that $3_5/5_5$ is the same as 1/3. What mistake has the student made?   **(COMPETENCY BASED QUESTION)**

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