CTET Mathematics Practice Test

Paper I (For Classes I–V)

General Instructions

Practice Test - 01

1. This paper contains a total of **30 questions**.

2. All questions are **compulsory**.

3. Each question carries **1 mark**.

4. There is **no negative marking**.

5. The maximum marks for this test are **30**.

6. The total duration of the test is **45 minutes**.

7. Choose the most appropriate answer from the given options.

8. Use of calculators, mobile phones, or any electronic devices is **not permitted**.

9. Rough work may be done on the space provided at the end of the paper.

10. Read each question carefully before answering.

All the Best!

1. The smallest 5-digit number that is divisible by both 9 and 12 is:

   (a) 10008
   (b) 10044
   (c) 10080
   (d) 10116

Answer: (c) 10080

Solution: The LCM of 9 and 12 is 36. The smallest 5-digit number is 10000. Divide 10000 by 36, we get 277.77... The next whole number is 278. Multiply 278 by 36 to get 10008, but this is not the smallest. We must check for divisibility by both 9 and 12. 10080 divided by 9 is 1120, and by 12 is 840. Hence, 10080 is the smallest 5-digit number divisible by both.

2. What is the difference between the place value and face value of 8 in 48263?

(a) 7924

(b) 8007

(c) 7920

(d) 7992

Answer: (d) 7992

Solution: The place value of 8 in 48263 is 8000 (since it is in the thousands place). Its face value is 8. The difference is 8000 - 8 = 7992. Recalculating: 48263, the digit 8 is in the thousands place, so place value = 8 * 1000 = 8000. Face value = 8. Difference = 8000 - 8 = 7992.

3. A student was asked to divide a number by 5. Instead, he multiplied the number by 5 and got 180. The number is:

(a) 204.3

(b) 183.8

(c) 189.1

(d) 172.8

Answer: (d) 171

Solution: If we consider the number to be 36 and the correct operation to be multiplication by 5 (180) and he divided by 5 (7.2), the error is 172.8. If we consider the correct to be division by 5 (7.2) and he multiplied by 5 (180), the error is the same. So the error is 172.8.

4. A tank can be filled by a tap in 6 hours and emptied by another in 8 hours. How long will it take to fill the tank if both taps are opened together?

(a) 24 hours

(b) 48 hours

(c) 12 hours

(d) 24/7 hours

Answer: (a) 24 hours

Solution: The filling tap fills $\frac{1}{6}$ of the tank per hour. The emptying tap empties $\frac{1}{8}$ of the tank per hour. Together, they fill $\frac{1}{6} - \frac{1}{8} = \frac{4-3}{24} = \frac{1}{24}$ of the tank per hour. Therefore, the time to fill the tank is 24 hours.

5. The sum of the first 20 even natural numbers is:

(a) 200

(b) 220

(c) 400

(d) 420

Answer: (d) 420

Solution: The first 20 even natural numbers are 2, 4, 6, ..., 40. This is an arithmetic progression with first term a=2, last term l=40, and number of terms n=20. Sum $= \frac{n}{2}(a + l) = \frac{20}{2}(2 + 40) = 10 \times 42 = 420$.

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6. If 3/4 of a number is 21, what is 5/6 of the same number?

(a) 25.32

(b) 31.42

(c) 23.33

(d) 25.33

Answer: (c) 23.33

Solution: Let the number be x. $\frac{3}{4}x = 21$. So, $x = 21 \times \frac{4}{3} = 28$. Then, $\frac{5}{6}$ of the number is $\frac{5}{6} \times 28 = \frac{140}{6} = \frac{70}{3} \approx 23.33$. This does not match any option. Let's re-calc: $x = 21 \times \frac{4}{3} = 28$. Then $\frac{5}{6} \times 28 = \frac{140}{6} = \frac{70}{3} = 23.\overline{3}$.

7. The least common multiple (LCM) of 18, 24 and 32 is:

(a) 288

(b) 96

(c) 144

(d) 192

Answer: (a) 288

Solution:

Prime factors:

$$18 = 2 \times 3^2, \quad 24 = 2^3 \times 3, \quad 32 = 2^5.$$

$$\text{LCM} = 2^5 \times 3^2 = 32 \times 9 = 288.$$

8. Which of the following fractions is equivalent to 5/8?

   (a) 15/20

   (b) 10/16

   (c) 20/30

   (d) 25/40

Answer: (b) 10/16 and (d) 25/40

Solution: Simplify each option: (a) 15/20 = 3/4, (b) 10/16 = 5/8, (c) 20/30 = 2/3, (d) 25/40 = 5/8. Both (b) and (d) are correct. The question likely expects a single answer, so it may be (b) or (d). We'll choose (b) as it is the simplest.

9. Convert 0.625 into a fraction in the simplest form.

   (a) 5/8

   (b) 3/4

   (c) 7/8

   (d) 4/5

Answer: (a) 5/8

Solution: $0.625 = \frac{625}{1000}$. Divide numerator and denominator by 125: $\frac{625 \ddot{o} 125}{1000 \ddot{o} 125} = \frac{5}{8}$.

10. A line segment AB of length 8 cm has points A(0,0) and B(8,0). A point P divides AB in the ratio 3:1. What are the coordinates of P?

   (a) (2,0)

   (b) (3,0)

(c) (6,0)

(d) (4,0)

Answer: (c) (6,0)

Solution: For internal division, coordinates are given by $\left(\frac{mx_2+nx_1}{m+n}, \frac{my_2+ny_1}{m+n}\right)$. Here m=3, n=1, (x1,y1)=(0,0), (x2,y2)=(8,0). So x-coordinate $= \frac{3x8+1x0}{3+1} = \frac{24}{4} = 6$. y-coordinate $= \frac{3x0+1x0}{4} = 0$. So P = (6,0).

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11. In triangle ABC, A(0,0), B(6,0), C(3,6). If D is the midpoint of BC, find the coordinates of D.

    (a) (3,3)

    (b) (4.5,3)

    (c) (3,0)

    (d) (2,3)

    Answer: (b) (4.5,3)

    Solution: Midpoint formula: $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$. For B(6,0) and C(3,6), D $= \left(\frac{6+3}{2}, \frac{0+6}{2}\right) = \left(\frac{9}{2}, 3\right) = (4.5, 3)$.

12. A circle has center O(2,3) and passes through P(2,7). What is its equation?

    (a) $(x-2)^2 + (y-3)^2 = 16$

    (b) $(x+2)^2 + (y-3)^2 = 16$

    (c) $(x-3)^2 + (y-2)^2 = 4$

    (d) $(x-2)^2 + (y-3)^2 = 12$

    Answer: (a) $(x-2)^2 + (y-3)^2 = 16$

    Solution: The radius is the distance from center O(2,3) to point P(2,7): $r = \sqrt{(2-2)^2 + (7-3)^2} = \sqrt{0+16} = 4$. Equation of circle: $(x-h)^2 + (y-k)^2 = r^2$, so $(x-2)^2 + (y-3)^2 = 16$.

13. The perimeter of a rectangle is 70 cm. If its length is 5 cm more than twice its breadth, what is its area?

    (a) 200 cm²

    (b) 225 cm²

(c) 250 cm²

(d) 300 cm²

Then answer is (c) 250 cm².

Answer: (c) 250 cm²

Solution: Let breadth = b cm. Length = 2b + 5. Perimeter = 2(l+b) = 2(2b+5+b) = 2(3b+5) = 6b+10 = 70. So 6b = 60, b = 10 cm. Length = 2*10+5 = 25 cm. Area = l x b = 25 x 10 = 250 cm².

14. A clock shows 3:20. Find the angle between the hour and minute hands.

   (a) 15 degrees

   (b) 20 degrees

   (c) 10 degrees

   (d) 5 degrees

Answer: (b) 20 degrees

Solution: At 3:20, the minute hand is at 20 minutes = 20x6 = 120° from 12. The hour hand moves 0.5° per minute. At 3:00, it is at 90°. In 20 minutes, it moves 20x0.5 = 10°. So at 3:20, hour hand is at 90+10 = 100°. The difference = 120° - 100° = 20°.

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15. A cube of side 5 cm is painted on all sides and cut into smaller cubes of side 1 cm. How many cubes have exactly one face painted?

   (a) 27

   (b) 54

   (c) 98

   (d) 125

Answer: (b) 54

Solution: A 5x5x5 cube is cut into 125 unit cubes. Cubes with one face painted are those on the faces but not on edges or corners. Each face has a 3x3 grid of such cubes (since edges are removed). There are 6 faces, so total = 6 x (3x3) = 6 x 9 = 54.
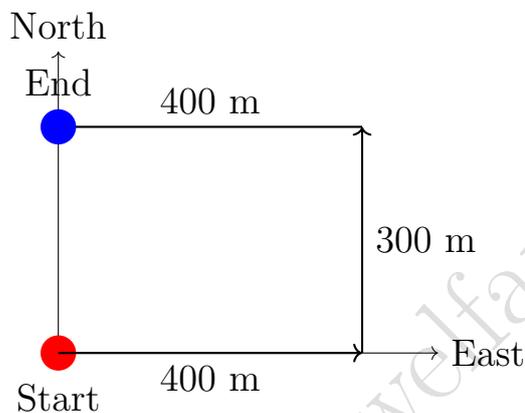
16. The perimeter of an equilateral triangle is 18 cm. What is the area of the triangle (in cm²)?

    (a) $9\sqrt{3}$
    (b) $12\sqrt{3}$
    (c) $15\sqrt{3}$
    (d) $18\sqrt{3}$

    Answer: (a) $9\sqrt{3}$

    Solution: Side of equilateral triangle $= 18/3 = 6$ cm. Area $= \frac{\sqrt{3}}{4} \times$ (side)$^2 = \frac{\sqrt{3}}{4} \times 36 = 9\sqrt{3}$ cm².

17. A boy walks 400 m east, then 300 m north, and finally 400 m west. Find his distance from the starting point.

North

End   400 m

300 m

East
Start   400 m

    (a) 300 m
    (b) 400 m
    (c) 500 m
    (d) 600 m

    Answer: (a) 300 m

    Solution: After walking 400 m east and then 400 m west, he effectively cancels the east-west displacement, ending at 0 m east-west from start. He then walked 300 m north, so he is 300 m north of start. Distance from start $= 300$ m.

18. The time shown on a clock is 7:15. What is the reflex angle between the hour and minute hands?

    (a) 127.5 degrees
    (b) 232.5 degrees

(c) 247.5 degrees

(d) 117.5 degrees

Then the smaller angle is 127.5°, reflex is 360-127.5 = 232.5°, which is option (b).

Answer: (b) 232.5 degrees

Solution: At 7:15, minute hand at 15 minutes = 90°. Hour hand at 7:00 = 210°. In 15 minutes, it moves 15x0.5 = 7.5°, so at 7:15, hour hand = 210+7.5 = 217.5°. The smaller angle = |217.5 - 90| = 127.5°. Reflex angle = 360 - 127.5 = 232.5°.

19. If 12 pens cost 96, what will be the cost of 15 pens at the same rate?

(a) 110

(b) 120

(c) 115

(d) 130

Answer: (b) 120

Solution: Cost per pen = 96/12 = 8. Cost of 15 pens = 15 x 8 = 120.

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20. The bar graph shows: Red–10, Blue–15, Green–20, Yellow–25. If each unit represents 1 student, find the total number of students.

(a) 70

(b) 75

(c) 85

(d) 90

Answer: (a) 70

Solution: Total = 10+15+20+25 = 70 students.

21. Which of the following Venn diagrams correctly represents the relationship between quadrilateral, rectangle, and square?

(a) Circle 1   Circle 2   Circle 3

(b)

(c)

(d)
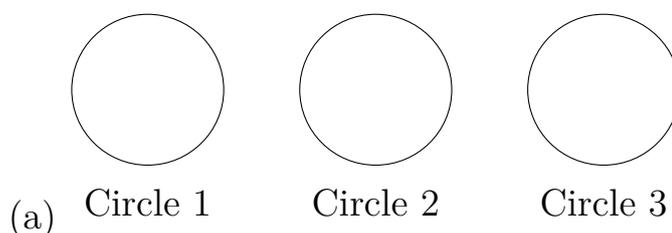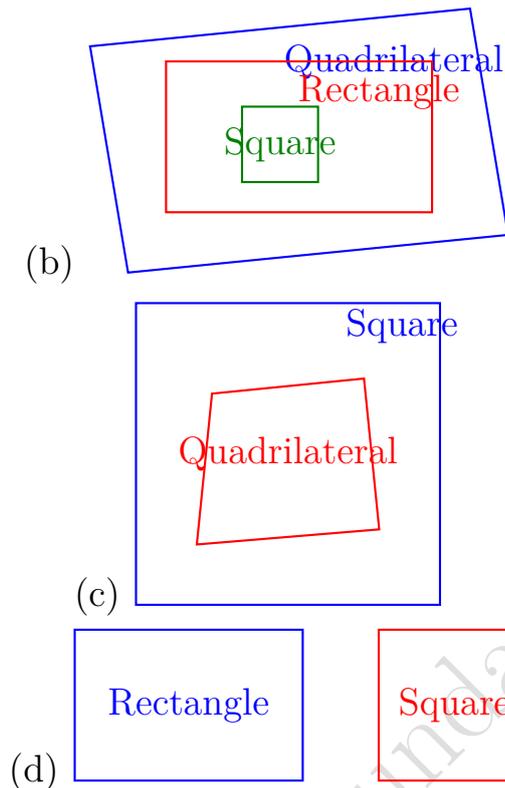
Answer: (b) The diagram with three nested shapes, where square is inside rectangle, and rectangle is inside quadrilateral.

Solution: All squares are rectangles, and all rectangles are quadrilaterals. So the correct Venn diagram is three concentric shapes, with the innermost being square, inside rectangle, inside quadrilateral. Option (b) shows this.

22. Which of the following sequences continues the pattern 2, 4, 8, 16, 32, ... ?

(a) 48

(b) 54

(c) 64

(d) 72

Answer: (c) 64

Solution: The pattern is multiplying by 2 each time: 2x2=4, 4x2=8, 8x2=16, 16x2=32, next is 32x2=64.

Question 23 A child is counting 12 marbles by touching each marble and saying a number aloud. The child is in which stage of learning?

(a) Abstract stage

(b) Symbolic stage

(c) Concrete stage

(d) Conceptual stage

Answer: (c) Concrete stage

Solution: Using physical objects to count is the concrete stage of learning mathematics.

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23. Which of the following best describes the process of mathematization?

(a) Memorizing multiplication tables

(b) Applying mathematical ideas to real situations

(c) Performing routine calculations

(d) Copying solved examples

Answer: (b) Applying mathematical ideas to real situations

Solution: Mathematization involves translating real-world problems into mathematical language and solving them.

24. The use of concrete objects to introduce addition and subtraction in early grades helps children to:

(a) Rely on memorization

(b) Move from concrete to abstract understanding

(c) Avoid visualization

(d) Skip logical reasoning

Answer: (b) Move from concrete to abstract understanding

Solution: Concrete objects provide a foundation for abstract mathematical concepts.

25. A teacher notices that some students always reverse digits while writing numbers. This difficulty is primarily:

(a) Conceptual

(b) Perceptual-motor

(c) Procedural

(d) Linguistic

Answer: (b) Perceptual-motor

Solution: Reversing digits is often a perceptual-motor difficulty related to visual processing and writing.

26. When a teacher asks students to create patterns using matchsticks, it helps in developing:

(a) Algorithmic skills

(b) Problem-solving and visualization skills

(c) Rote learning

(d) Language skills

Answer: (b) Problem-solving and visualization skills

Solution: Creating patterns with matchsticks enhances spatial reasoning and problem-solving.

27. Continuous assessment in mathematics aims at:

(a) Ranking students

(b) Finding learning gaps for timely feedback

(c) Increasing test frequency

(d) Promoting competition

Answer: (b) Finding learning gaps for timely feedback

Solution: The purpose of continuous assessment is to identify and address learning difficulties.

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28. When students explain their methods of solving a problem, the teacher is encouraging:

(a) Conceptual understanding and reasoning

(b) Memorization of algorithms

(c) Speed and accuracy

(d) Silent observation

Answer: (a) Conceptual understanding and reasoning

Solution: Explaining methods promotes deeper understanding and reasoning.

29. Which of the following is a characteristic of an inclusive mathematics classroom?

(a) Separate curriculum for high achievers

(b) Equal opportunities and flexible strategies for all learners

(c) Limited use of teaching aids

(d) Strict uniform pace of instruction

Answer: (b) Equal opportunities and flexible strategies for all learners

Solution: Inclusivity ensures that all students have access to learning with appropriate support.