Achievers Home Tuitions
Home tuitions since 1999 · Chandigarh and online

FREE RESOURCE
hometutorsindia.com

EXAM GUIDE · GRADES 3 TO 10

AMC 8 and Math Kangaroo Guide with Practice Questions

The maths competitions students take in the US, Canada and the UK: how each one works, the facts worth knowing by heart, how to guess wisely, and twelve AMC-style questions with answers.

Maths Olympiad

01 The competitions at a glance

Contest	Who	Format
AMC 8	Grade 8 and below	25 multiple-choice questions in 40 minutes, 1 point each, no penalty. Held in January
AMC 10 and AMC 12	Grade 10 and below; grade 12 and below	25 questions in 75 minutes: 6 points for a right answer, 1.5 for a blank, 0 for a wrong one. Held in November, on an A date and a B date
AIME	By invitation, from AMC 10 and 12 scores	15 questions with answers from 000 to 999, in 3 hours
Math Kangaroo (USA)	Grades 1 to 12	24 questions for grades 1–4 and 30 for grades 5–12, in 75 minutes, worth 3, 4 or 5 points; no penalty. 18 March 2027
MATHCOUNTS	Grades 6 to 8	School, chapter, state and national rounds, alone and in teams
CEMC (Canada)	Grades 7 to 12	Gauss for grades 7 and 8, then Pascal, Cayley and Fermat, and the Euclid with written solutions
UKMT (UK)	Years 7 to 13	The Junior, Intermediate and Senior Mathematical Challenges, 25 multiple-choice questions each, then follow-on rounds

02 Facts worth knowing by heart

Primes under 50 – 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47

Squares – up to $25^2 = 625$; cubes up to $10^3 = 1000$; powers of 2 up to $2^{10} = 1024$

Right triangles – 3-4-5, 5-12-13, 8-15-17, 7-24-25, 20-21-29, and their multiples

Angles – a polygon with n sides has interior angles adding to $(n - 2) \times 180°$

Areas – triangle $\frac{1}{2}bh$; trapezium $\frac{1}{2}(a + b)h$; circle πr^2; circumference $2\pi r$

Sum 1 to n – $n(n + 1)/2$

Counting – n! orders of n things; C(n, r) ways to choose r of them

Probability – favourable outcomes ÷ all equally likely outcomes

Units digits – powers repeat in cycles of at most 4: 3, 9, 7, 1 for powers of 3

03 Strategy

Use the answer choices – try them in the question when the algebra is slow

Estimate, then eliminate – rule out choices that are clearly too big or too small

Draw a picture – for every geometry and counting question

Small cases – try the pattern with 1, 2 and 3 before the big number

AMC 8 and Math Kangaroo – no penalty, so answer every question

AMC 10 and 12 – a blank earns 1.5, a wild guess about 1.2 on average; guess once you can rule out two choices

Time – AMC 8 gives about 1.5 minutes a question: move on and come back

04 Practice questions

1 mark each

1 1 + 2 + 3 + … + 20 = ?

(A) 190 (B) 200 (C) 210 (D) 220 (E) 420

2 How many prime numbers are there between 30 and 50?

(A) 4 (B) 5 (C) 6 (D) 7 (E) 8

3 A rectangle has perimeter 30 and area 56. What is the length of its longer side?

(A) 12 (B) 10 (C) 9 (D) 8 (E) 7

4 What is the units digit of 3^{2027}?

(A) 7 (B) 9 (C) 1 (D) 3 (E) 5

5 Two fair dice are rolled. What is the probability that the total is 7?

(A) 1/12 (B) 1/9 (C) 7/36 (D) 1/4 (E) 1/6

6 A circle has circumference 10π. What is its area?

(A) 10π (B) 20π (C) 25π (D) 50π (E) 100π

7 The average of four numbers is 15. Three of them are 10, 12 and 20. What is the fourth?

(A) 18 (B) 15 (C) 13 (D) 20 (E) 23

8 In how many ways can the letters of the word MATH be arranged?

(A) 4 (B) 12 (C) 16 (D) 48 (E) 24

9 What is the sum of the interior angles of a pentagon?

(A) 360° (B) 540° (C) 450° (D) 720° (E) 900°

10 A price is raised by 20% and then cut by 20%. Compared with the starting price, the final price is:

(A) the same (B) 4% more
(C) 2% less (D) 4% less
(E) 20% less

11 What is the smallest positive integer that leaves a remainder of 1 when divided by 2, 3, 4, 5 or 6?

(A) 31 (B) 59 (C) 121 (D) 601 (E) 61

12 A 3 × 3 × 3 cube is painted on the outside and cut into 27 unit cubes. How many unit cubes have exactly one painted face?

(A) 1 (B) 6 (C) 8 (D) 12 (E) 27

Answers and explanations

1	C	n(n + 1)/2 = 20 × 21 ÷ 2 = 210.
2	B	31, 37, 41, 43 and 47.
3	D	The sides add up to 15 and multiply to 56, so they are 7 and 8.
4	A	Units digits of powers of 3 repeat 3, 9, 7, 1. 2027 leaves remainder 3 when divided by 4, so the units digit is 7.
5	E	6 of the 36 outcomes make 7: (1, 6), (2, 5), (3, 4), (4, 3), (5, 2) and (6, 1). 6/36 = 1/6.
6	C	$2\pi r = 10\pi$ gives r = 5, so the area is $\pi \times 5^2 = 25\pi$.
7	A	The four add up to 60, and 60 − (10 + 12 + 20) = 18.
8	E	4 different letters: 4! = 4 × 3 × 2 × 1 = 24.
9	B	(5 − 2) × 180° = 540°.
10	D	1.2 × 0.8 = 0.96, which is 4% less than the start.
11	E	The LCM of 2, 3, 4, 5 and 6 is 60, so the answer is 60 + 1 = 61.
12	B	One in the centre of each of the 6 faces.

How to use this guide

1. Past AMC papers and solutions are free online: do one a week, timed.
2. After each paper, redo every question you missed without looking at the solution.
3. Check the dates and rules each year on the MAA, Math Kangaroo, CEMC or UKMT site.

ACHIEVERS · SINCE 1999

Want an online tutor for AMC or Math Kangaroo?

One-to-one tutors at home in the Chandigarh Tricity, or live online anywhere. Our office confirms the tutor and the fee before the first class.

WhatsApp +91 86990 09555

hometutorsindia.com

Scan to WhatsApp

Free to print and share for study. Please keep the Achievers name and number on every page. Exam patterns change, so always check the details with the official board or testing agency. © 2026 Achievers Home Tuitions · https://www.hometutorsindia.com/amc-8-math-kangaroo-guide.html