

# AMC 8 Tables

## Squares

$$\begin{aligned}11^2 &= 121 \\12^2 &= 144 \\13^2 &= 169 \\14^2 &= 196 \\15^2 &= 225 \\16^2 &= 256 \\17^2 &= 289 \\18^2 &= 324 \\19^2 &= 361 \\20^2 &= 400 \\21^2 &= 441 \\22^2 &= 484 \\23^2 &= 529 \\24^2 &= 576 \\25^2 &= 625\end{aligned}$$

## Cubic

$$\begin{aligned}2^3 &= 8 \\3^3 &= 27 \\4^3 &= 64 \\5^3 &= 125 \\6^3 &= 216 \\7^3 &= 343\end{aligned}$$

## Power of 2

$$\begin{aligned}2^4 &= 16 \\2^5 &= 32 \\2^6 &= 64 \\2^7 &= 128 \\2^8 &= 256 \\2^9 &= 512 \\2^{10} &= 1024\end{aligned}$$

## Pythagorean triples

$$\begin{aligned}(3,4,5) \\(6,8,10) \\(9,12,15) \\(12,16,20) \\(15,20,25) \\(5,12,13) \\(8,15,17) \\(7,24,25)\end{aligned}$$

## Sum

$$\begin{aligned}1+2+3+4+5 &= 15 \\1+2+3+4+5+6 &= 21 \\1+2+3+4+5+6+7 &= 28 \\1+2+3+4+5+6+7+8 &= 36 \\1+2+3+4+5+6+7+8+9 &= 45 \\1+2+3+4+5+6+7+8+9+10 &= 55\end{aligned}$$

## Factorial

$$\begin{aligned}3! &= 6 \\4! &= 24 \\5! &= 120 \\6! &= 720\end{aligned}$$

## Square Roots

$$\sqrt{121} = 11$$

$$\sqrt{144} = 12$$

$$\sqrt{169} = 13$$

$$\sqrt{196} = 14$$

$$\sqrt{225} = 15$$

$$\sqrt{256} = 16$$

$$\sqrt{289} = 17$$

$$\sqrt{324} = 18$$

$$\sqrt{361} = 19$$

$$\sqrt{400} = 20$$

$$\sqrt{441} = 21$$

$$\sqrt{484} = 22$$

$$\sqrt{529} = 23$$

$$\sqrt{576} = 24$$

$$\sqrt{625} = 25$$

## Fraction to Decimal

$$1/8 = 0.125 = 12.5\%$$

$$3/8 = 0.375$$

$$5/8 = 0.625$$

$$7/8 = 0.875$$

$$1/5 = 0.2 = 20\%$$

$$2/5 = 0.4$$

$$3/5 = 0.6$$

$$4/5 = 0.8$$

## Repeating Decimal

$$1/3 = 0.3333$$

$$1/9 = 0.1111... = 0.\bar{1}$$

$$2/9 = 0.2222... = 0.\bar{2}$$

$$4/9 = 0.4444... = 0.\bar{4}$$

$$1/6 = 0.1666... = 0.1\bar{6}$$

## Prime Numbers

2, 3, 5, 7, 11, 13, 17, 19, 23,  
29, 31, 37, 41, 43, 47, 53, 59,  
61, 67, 71, 73, 79, 83, 89, 97

## Prime Factorization

$$27 = 3^3$$

$$32 = 2^5$$

$$33 = 3 \times 11$$

$$36 = 2^2 \times 3^2$$

$$51 = 3 \times 17$$

$$52 = 4 \times 13$$

$$56 = 7 \times 8$$

$$57 = 3 \times 19$$

$$69 = 3 \times 23$$

$$72 = 8 \times 9$$

$$74 = 2 \times 37$$

$$75 = 3 \times 25$$

$$76 = 4 \times 19$$

$$78 = 6 \times 13$$

$$84 = 7 \times 12$$

$$85 = 5 \times 17$$

$$87 = 3 \times 29$$

$$91 = 7 \times 13$$

$$92 = 4 \times 23$$

$$93 = 3 \times 31$$

## Divisibility Rules

- **2** if the last digit of  $N$  is 2, 4, 6, 8, or 0;
- **3** if the sum of digits of  $N$  is a multiple of 3;
- **4** if the last 2 digits of  $N$  are a multiple of 4;
- **5** if the last digit of  $N$  is either 0 or 5;
- **6** if  $N$  is divisible by both 2 and 3;
- **8** if the last 3 digits of  $N$  are a multiple of 8;
- **9** if the sum of digits of  $N$  is a multiple of 9;

## Combination

$$\binom{5}{2} = \frac{5 \times 4}{2 \times 1} = 10$$

$$\binom{5}{3} = \frac{5 \times 4 \times 3}{3 \times 2 \times 1} = 10$$

$$\binom{6}{2} = 15$$

$$\binom{6}{3} = 20$$

$$\binom{4}{3} = \binom{4}{1} = 4$$

$$\binom{3}{2} = \binom{3}{1} = 3$$