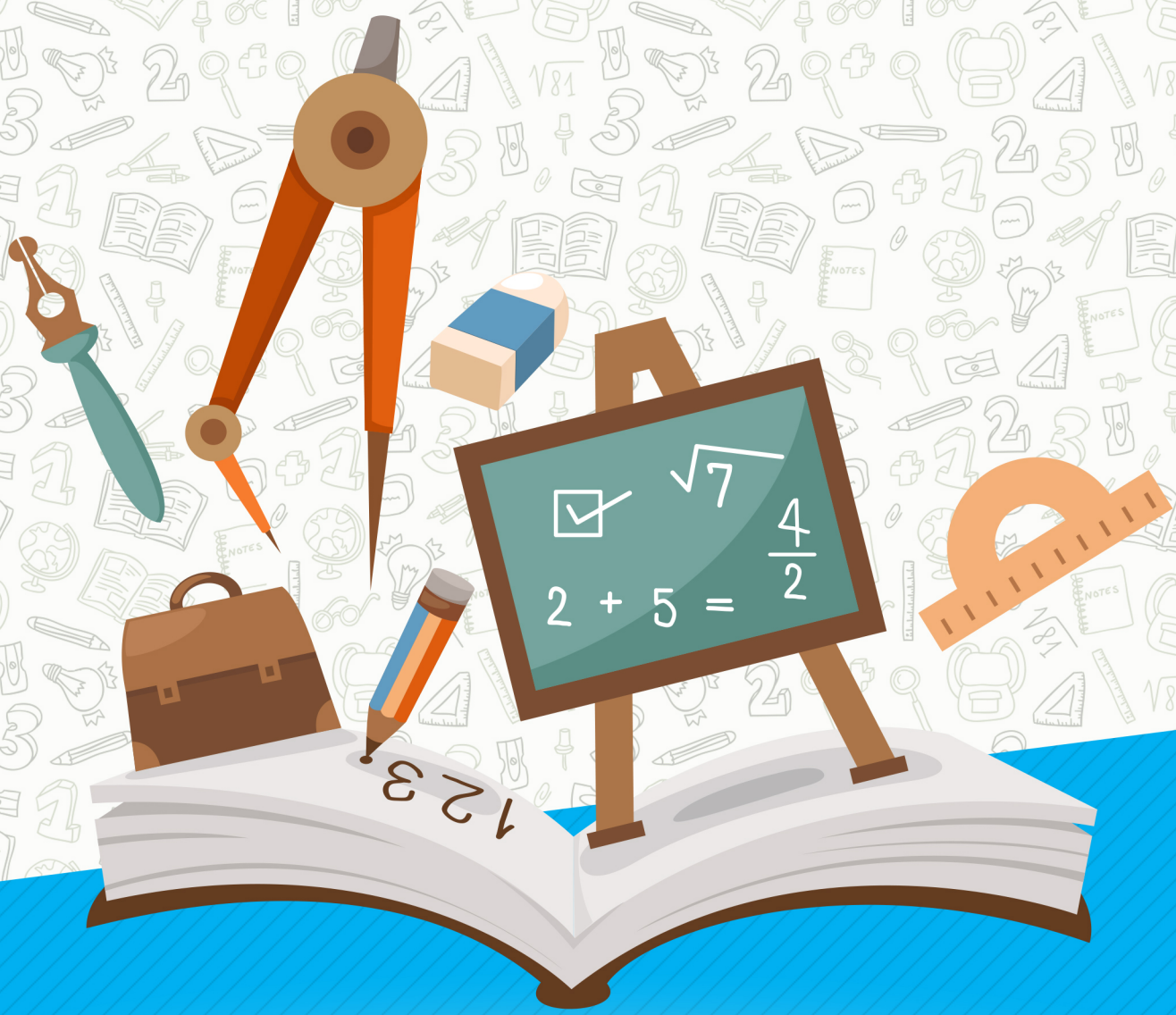
macmillan education

COMMON ERRORS

in Mathematics



COMMON ERRORS IN MATHEMATICS

1. Integers

Sl. No.	INCORRECT	CORRECT
1.	-22+2 = -24	-22+2 = -20
2.	-22 - 2 = -20	-22 - 2 = -24
3.	-96 > -69	-96 < -69
4.	-9 × -6 = -54	-9 × -6 = 54
5.	-100 - (-289) = -389	-100 - (-289) = 189

2. Fractions

Sl. No.	INCORRECT	CORRECT
1.	$4 \times 5\frac{1}{4} = 5$	$4 \times 5\frac{1}{4} = 21$
2.	$7 + \frac{1}{7} = \frac{8}{7}$	$7 + \frac{1}{7} = \frac{50}{7}$
3.	$3\frac{1}{2} < \frac{5}{2}$	$3\frac{1}{2} > \frac{5}{2}$
4.	$\frac{2}{0} = 0$	$\frac{2}{0} =$ Infinity
5.	$\frac{1}{3}$ of $3\frac{1}{3} = \frac{1}{3}$	$\frac{1}{3}$ of $3\frac{1}{3} = 1\frac{1}{9}$
6.	$\frac{2}{3} \div 3 = 2$	$\frac{2}{3} \div 3 = \frac{2}{9}$
7.	$\frac{3}{4} \div \frac{1}{3} = \frac{1}{4}$	$\frac{3}{4} \div \frac{1}{3} = \frac{9}{4}$
8.	Reciprocal of $5\frac{1}{7} = 5\frac{7}{1}$	Reciprocal of $5\frac{1}{7} = \frac{7}{36}$

3. Decimals

Sl. No.	INCORRECT	CORRECT
1.	$0.009 > 0.03$	$0.009 < 0.03$
2.	$0.10 \div 0.2 = 5$	$0.10 \div 0.2 = 0.5$
3.	$0.25 \times 0.4 = 1$	$0.25 \times 0.4 = 0.1$
4.	$0.02^3 = 0.08$	$0.02^3 = 0.000008$
5.	$10.20 \div 10 = 1.2$	$10.20 \div 10 = 1.02$
6.	$0.48 \div 0.12 = 0.04$	$0.48 \div 0.12 = 4$

4. Rational Numbers

Sl. No.	INCORRECT	CORRECT
1.	$\frac{2}{0}$ is a **Rational** number.	$\frac{2}{0}$ is an **Irrational** number.
2.	0 is a **Natural** number.	0 is a **Whole** number.
3.	$\frac{3}{4} \div 0 = 0$	$\frac{3}{4} \div 0$ = **Not Defined**
4.	Multiplicative inverse of $\frac{-3}{11} = \frac{11}{3}$	Multiplicative inverse of $\frac{-3}{11} = \frac{-11}{3}$
5.	The reciprocal of -1 is 1.	The reciprocal of -1 is -1.

5. Powers and Exponents

Sl. No.	INCORRECT	CORRECT
1.	$7^2 > 2^7$	$7^2 < 2^7$
2.	$2^0 = 0$	$2^0 = 1$
3.	$(-1)^2 = -1$	$(-1)^2 = 1$
4.	$(-1)^3 = 1$	$(-1)^3 = -1$
5.	$(a^2)^3 = a^5$	$(a^2)^3 = a^6$
6.	$a^4 \times a^3 = a^{12}$	$a^4 \times a^3 = a^7$
7.	$a^{-4} \times a^{-3} = a^{12}$	$a^{-4} \times a^{-3} = a^{-7}$
8.	$(6)^{-3} = -216$	$(6)^{-3} = \frac{1}{216}$

Sl. No.	INCORRECT	CORRECT
1.	$3x^2 + 3x^3 = 6x^5$	$3x^2 + 3x^3 = 3x^2(1 + x)$
2.	$-7x^3 + 3x^3 = -10x^3$	$-7x^3 + 3x^3 = -4x^3$
3.	$(-3x)^2 = 3x^2$	$(-3x)^2 = 9x^2$
4.	$(9x^2)^{1/2} = 9x$	$(9x^2)^{1/2} = 3x$
5.	$(3x^2 - x)/x = 3x^2 - 1$	$(3x^2 - x)/x = 3x - 1$

7. Factorisation

Sl. No.	INCORRECT	CORRECT
1.	The HCF of $45x^3y^2$ and $30x^4y$ is $15x^4y^2$.	The HCF of $45x^3y^2$ and $30x^4y$ is $15x^3y$.
2.	$64x^2y^2z \div 8xy = 8z$	$64x^2y^2z \div 8xy = 8xyz$
3.	$(6x^3 + 8x^2 + 2x) \div 2x = 6x^3 + 8x^2$	$(6x^3 + 8x^2 + 2x) \div 2x = 3x^2 + 4x + 1$
4.	$(x - y)^2 = x^2 - y^2$	$(x - y)^2 = x^2 - 2xy + y^2$
5.	$(2x - 5)(x + 2) = 2x^2 - 10$	$(2x - 5)(x + 2) = 2x^2 - x - 10$
6.	If $x = -5$, $3x = 3 - 5 = -2$	If $x = -5$, $3x = 3 \times (-5) = -15$

Sl. No.	INCORRECT	CORRECT
1.	$\frac{13}{4} + 2x = 4 \Rightarrow 13 + 2x = 16$	$\frac{13}{4} + 2x = 4 \Rightarrow 13 + 8x = 16$
2.	$2x^2 = 2y^2 \Rightarrow x = y$	$2x^2 = 2y^2 \Rightarrow x^2 = y^2$
3.	$2x = 2 \Rightarrow x = 0$	$2x = 2 \Rightarrow x = 1$
4.	$\frac{x}{2} - 1 = 0 \Rightarrow x = 0 + 1$ $\Rightarrow x = 1$	$\frac{x}{2} - 1 = 0 \Rightarrow x = 1 \times 2$ $\Rightarrow x = 2$

Sl. No.	INCORRECT	CORRECT
1.	7:18 < 16:45	7:18 > 16:45
2.	$\frac{8}{x} :: \frac{x}{2}$ => $10 = 2x$ => $x = 5$	$\frac{8}{x} :: \frac{x}{2}$ => $16 = x^2$ => $x = 4$
3.	If 2 men take 5 days to complete a piece of work, then **10 men would take 25 days.**	If 2 men take 5 days to complete a piece of work, then **10 men would take 1 day.**
4.	When speed increases, time taken also **increases**.	When speed increases, time taken **decreases**.

Sl. No.	INCORRECT	CORRECT
1.	0.5 = 5%	0.5 = 50%
2.	$\frac{5}{4}$ = 1.25%	$\frac{5}{4}$ = 125%
3.	50 parts of 400 = 200%	50 parts of 400 = 12.5%
4.	0.01 = 10%	0.01 = 1%
5.	1.01 = 10.1%	1.01 = 101%
6.	10% increase in 60% = 70%	10% increase in 60% = 66%
7.	Profit % = 20%, S.P. = ₹ 120 => Profit = ₹ 20	Profit % = 20%, S.P. = ₹ 120 => Profit = ₹ 24
8.	Compound Interest for the first year is **greater than** the Simple Interest on the same principal and rate.	Compound Interest for the first year is **equal to** the Simple Interest on the same principal and rate.

Sl. No.	INCORRECT	CORRECT
9.	If interest is compounded quarterly, **time period is multiplied by 3.**	If interest is compounded quarterly, **time period is multiplied by 4.**
10.	If interest is compounded quarterly, then the **rate is taken as one-third of the rate.**	If interest is compounded quarterly, then the **rate is taken as one-fourth of the rate.**

Sl. No.	INCORRECT	CORRECT
1.	A line has **2 end points**.	A line has **no end point**.
2.	70° and 20° are **Supplementary angles**.	70° and 20° are **Complementary angles**.
3.	Angles in a linear pair are **Complementary angles**.	Angles in a linear pair are **Supplementary angles**.
4.	The complement of an acute angle is **an obtuse angle**.	The complement of an acute angle is **also an acute angle**.
5.	In an obtuse-angled triangle, **all the interior angles are obtuse**.	In an obtuse-angled triangle, **any one of the interior angles is obtuse**.
6.	Altitude **always lies in the interior** of the triangle.	Altitude **can lie either in the interior or in the exterior** of the triangle.

Sl. No.	INCORRECT	CORRECT
7.	For any triangle, the measure of an exterior angle is equal to the **sum of the measures of its interior angles**.	For any triangle, the measure of an exterior angle is equal to the **sum of the measures of its interior opposite angles**.
8.	The sum of interior angles of a triangle is **360°**.	The sum of interior angles of a triangle is **180°**.
9.	All angles in an **isosceles triangle** are always 60°.	All angles in an **equilateral triangle** are always 60°.
10.	A chord is a **line** that joins two points on the circle.	A chord is a **line segment** that joins two points on the circle.
11.	The sum of interior angles of a quadrilateral is **180°**.	The sum of interior angles of a quadrilateral is **360°**.
12.	In a **trapezium**, the non-parallel sides are always equal.	In an **isosceles trapezium**, the non-parallel sides are always equal.

Sl. No.	INCORRECT	CORRECT
13.	In a kite, opposite sides are equal.	In a kite, two pairs of adjacent sides are equal.
14.	Diagonals of a kite bisect each other at right angles.	Diagonals of a kite intersect each other at right angles.
15.	Diagonals of a parallelogram intersect each other at right angles.	Diagonals of a parallelogram bisect each other.
16.	A decagon has 10 diagonals.	A decagon has 35 diagonals.
17.	The sum of interior angles of a polygon is 360°.	The sum of interior angles of a polygon is $(n - 2) \times 180°$.
18.	Area of a parallelogram $= \frac{1}{2} \times$ Base $\times$ Altitude	Area of a parallelogram = Base $\times$ Altitude
19.	A pentagonal prism has 5 faces.	A pentagonal prism has 7 faces.

Sl. No.	INCORRECT	CORRECT
20.	The meeting point of two or more edges is called a **plane**.	The meeting point of two or more edges is called a **vertex**.
21.	A rectangle has **four lines of symmetry**.	A rectangle has **two lines of symmetry**.
22.	A square has **two lines of symmetry**.	A square has **four lines of symmetry**.
23.	A circle has **four lines of symmetry**.	A circle has **infinite lines of symmetry**.
24.	Figures having **same shape but different size** are called congruent figures.	Figures having **same shape and size** are called congruent figures.

Sl. No.	INCORRECT	CORRECT
1.	Area of a circle = $2\pi r^2$	Area of a circle = πr^2
2.	Volume of a cuboidal box = Area of Base ÷ Height	Volume of a cuboidal box = Area of Base × Height
3.	Volume of a cylinder = $2\pi r^2 h$	Volume of a cylinder = $\pi r^2 h$
4.	Surface area of a cube = $6l^3$	Surface area of a cube = $6l^2$
5.	Surface area of a cylinder = $2\pi rh + r^2$	Surface area of a cylinder = $2\pi rh + 2\pi r^2$ = $2\pi r(h + r)$

Sl. No.	INCORRECT	CORRECT
1.	A bar graph has bars of **different heights and widths**.	A bar graph has bars of **different heights but of the same width**.
2.	In a set of observations, the observation that occurs most frequently is called **median**.	In a set of observations, the observation that occurs most frequently is called **mode**.
3.	In a pie chart, the angles must add up to **180°**.	In a pie chart, the angles must add up to **360°**.
4.	The point (-2, -2) lies in the **fourth quadrant**.	The point (-2, -2) lies in the **third quadrant**.
5.	In a histogram, the bars are drawn **with gaps between them**.	In a histogram, the bars are drawn **without any gap between them**.

14. Probability

Sl. No.	INCORRECT	CORRECT
1.	The probability of an event lies **between -1 and 1**.	The probability of an event lies **between 0 and 1**.
2.	If an event can never occur or is impossible to occur, then its probability is **negative**.	If an event can never occur or is impossible to occur, then its probability is **0**.
3.	The outcome which guarantees the occurrence of a particular event is said to be a **likely outcome**.	The outcome which guarantees the occurrence of a particular event is said to be a **favourable outcome**.
4.	When we toss a coin, there are an **infinite number of possible outcomes**.	When we toss a coin, there are **only two possible outcomes: 'head' or 'tail'**.
5.	The probability of getting a number less than 7 when a die is rolled is equal to **0**.	The probability of getting a number less than 7 when a die is rolled is equal to **1**.