

SPM Modern Mathematics Formulae List for Paper 1 and Paper 2

RELATIONS

1. $a^m \times a^n = a^{m+n}$

12. Pythagoras Theorem

2. $a^m \div a^n = a^{m-n}$

$c^2 = a^2 + b^2$

3. $(a^m)^n = a^{mn}$

13. $m = \frac{y_2 - y_1}{x_2 - x_1}$

4. $A^{-1} = \frac{1}{ad - bc} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$

14. $m = -\frac{y\text{-intercept}}{x\text{-intercept}}$

5. $P(A) = \frac{n(A)}{n(S)}$

6. $P(A') = 1 - P(A)$

7. Distance = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

8. Midpoint, $(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$

9. Average speed = $\frac{\text{distance travelled}}{\text{time taken}}$

10. Mean = $\frac{\text{sum of data}}{\text{number of data}}$

11. Mean = $\frac{\text{sum of (class mark} \times \text{frequency)}}{\text{sum of frequencies}}$

SHAPE AND SPACE

1. Area of trapezium = $\frac{1}{2} \times \text{sum of parallel sides} \times \text{height}$
2. Circumference of circle = $\pi d = 2\pi r$
3. Area of Circle = πr^2
4. Curved surface area of cylinder = $2\pi rh$
5. Surface area of sphere = $4\pi r^2$
6. Volume of right prism = cross sectional area \times length
7. Volume of cylinder = $\pi r^2 h$
8. Volume of cone = $\frac{1}{3} \pi r^2 h$
9. Volume of sphere = $\frac{4}{3} \pi r^3$
10. Volume of right pyramid = $\frac{1}{3} \times \text{base area} \times \text{height}$
11. Sum of interior angle of polygon = $(n - 2) \times 180^\circ$
12.
$$\frac{\text{arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$$
13. Scale factor, $k = \frac{PA'}{PA}$
14. Area of image = $k^2 \times \text{area of object}$