

SPM Additional Mathematics Formula List for Paper 1

ALGEBRA

$$1 \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$2 \quad a^m \times a^n = a^{m+n}$$

$$3 \quad a^m \div a^n = a^{m-n}$$

$$4 \quad (a^m)^n = a^{mn}$$

$$5 \quad \log_a mn = \log_a m + \log_a n$$

$$6 \quad \log_a \frac{m}{n} = \log_a m - \log_a n$$

$$7 \quad \log_a m^n = n \log_a m$$

$$8 \quad \log_a b = \frac{\log_c b}{\log_c a}$$

$$9 \quad T_n = a + (n-1)d$$

$$10 \quad S_n = \frac{n}{2}[2a + (n-1)d]$$

$$11 \quad T_n = ar^{n-1}$$

$$12 \quad S_n = \frac{a(r^n - 1)}{r - 1} = \frac{a(1 - r^n)}{1 - r}, \quad r \neq 1$$

$$13 \quad S_\infty = \frac{a}{1 - r}, \quad |r| < 1$$

CALCULUS (KALKULUS)

$$1 \quad y = uv, \quad \frac{dy}{dx} = u \frac{dv}{dx} + v \frac{du}{dx}$$

$$2 \quad y = \frac{u}{v}, \quad \frac{dy}{dx} = \frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$$

$$3 \quad \frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx}$$

$$4 \quad \text{Area under a curve} \\ \text{(Luas di bawah lengkung)} \\ = \int_a^b y \, dx \quad \text{or (atau)} \\ = \int_a^b x \, dy$$

$$5 \quad \text{Volume generated (Isipadu janaan)} \\ = \int_a^b \pi y^2 \, dx \quad \text{or (atau)} \\ = \int_a^b \pi x^2 \, dx$$

STATISTICS (STATISTIK)

1 $\bar{x} = \frac{\Sigma x}{N}$

7 $\bar{I} = \frac{\Sigma W_i I_i}{\Sigma W_i}$

2 $\bar{x} = \frac{\Sigma fx}{\Sigma f}$

8 ${}^n P_r = \frac{n!}{(n-r)!}$

3 $\sigma = \sqrt{\frac{\Sigma(x-\bar{x})^2}{N}} = \sqrt{\frac{\Sigma x^2}{N} - \bar{x}^2}$

9 ${}^n C_r = \frac{n!}{(n-r)! r!}$

4 $\sigma = \sqrt{\frac{\Sigma f(x-\bar{x})^2}{\Sigma f}} = \sqrt{\frac{\Sigma fx^2}{\Sigma f} - \bar{x}^2}$

10 $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

11 $P(X=r) = {}^n C_r p^r q^{n-r}, \quad p+q=1$

5 $m = L + \left(\frac{\frac{1}{2}N - F}{f_m} \right) C$

12 Mean (Min), $\mu = np$

13 $\sigma = \sqrt{npq}$

6 $I = \frac{Q_1}{Q_2} \times 100$

14 $Z = \frac{X - \mu}{\sigma}$

GEOMETRY (GEOMETRI)

1 Distance (Jarak)

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

5 $|\underline{r}| = \sqrt{x^2 + y^2}$

2 Midpoint (Titik tengah)

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

6 $\hat{r} = \frac{x\underline{i} + y\underline{j}}{\sqrt{x^2 + y^2}}$

3 A point dividing a segment of a line

(Titik yang membahagi suatu tembereng garis)

$$(x, y) = \left(\frac{nx_1 + mx_2}{m+n}, \frac{ny_1 + my_2}{m+n} \right)$$

4 Area of triangle (Luas segi tiga)

$$= \frac{1}{2} \left| (x_1 y_2 + x_2 y_3 + x_3 y_1) - (x_2 y_1 + x_3 y_2 + x_1 y_3) \right|$$

TRIGONOMETRY (TRIGONOMETRI)

- | | | | |
|---|--|----|--|
| 1 | Arc length, $s = j \theta$
Panjang lengkok, $s = j \theta$ | 8 | $\sin (A \pm B) = \sin A \cos B \pm \cos A \sin B$
$\sin (A \pm B) = \sin A \cos B \pm \cos A \sin B$ |
| 2 | Area of sector, $A = \frac{1}{2} j^2 \theta$
Luas sektor, $L = \frac{1}{2} j^2 \theta$ | 9 | $\cos (A \pm B) = \cos A \cos B \mp \sin A \sin B$
$\cos (A \pm B) = \cos A \cos B \mp \sin A \sin B$ |
| 3 | $\sin^2 A + \cos^2 A = 1$
$\sin^2 A + \cos^2 A = 1$ | 10 | $\tan (A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$ |
| 4 | $\sec^2 A = 1 + \tan^2 A$
$\sec^2 A = 1 + \tan^2 A$ | 11 | $\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$ |
| 5 | $\operatorname{cosec}^2 A = 1 + \cot^2 A$
$\operatorname{kosek}^2 A = 1 + \cot^2 A$ | 12 | $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ |
| 6 | $\sin 2A = 2 \sin A \cos A$
$\sin 2A = 2 \sin A \cos A$ | 13 | $a^2 = b^2 + c^2 - 2bc \cos A$
$a^2 = b^2 + c^2 - 2bc \cos A$ |
| 7 | $\cos 2A = \cos^2 A - \sin^2 A$
$= 2 \cos^2 A - 1$
$= 1 - 2 \sin^2 A$

$\cos 2A = \cos^2 A - \sin^2 A$
$= 2 \cos^2 A - 1$
$= 1 - 2 \sin^2 A$ | 14 | Area of triangle (Luas segitiga)
$= \frac{1}{2} a b \sin C$ |