

## ورقة عمل في النهايات المثلثية

|   |                                                         |           |
|---|---------------------------------------------------------|-----------|
| ① | $f(x) = \frac{2\sin x}{3x}$                             | $; a = 0$ |
| ② | $f(x) = \frac{3\sin(2x)}{-5x}$                          | $; a = 0$ |
| ③ | $f(x) = \frac{\sin 3x}{\sin 4x}$                        | $; a = 0$ |
| ④ | $f(x) = \frac{x + \tan x}{x + \sin x}$                  | $; a = 0$ |
| ⑤ | $f(x) = \frac{\sin x(2023x)}{\sin(x)}$                  | $; a = 0$ |
| ⑥ | $f(x) = \frac{\sin x - \sin 3x}{3x}$                    | $; a = 0$ |
| ⑦ | $f(x) = \frac{x \sin x}{1 - \cos^2(2x)}$                | $; a = 0$ |
| ⑧ | $f(x) = \frac{x \sin(3x)}{x^2 - 2\sin^2(x)}$            | $; a = 0$ |
| ⑨ | $f(x) = \frac{1 - \cos^2 x}{4x \sin(x)}$                | $; a = 0$ |
| ⑩ | $f(x) = \frac{\tan x - \sin x}{\sin^3 x}$               | $; a = 0$ |
| ⑪ | $f(x) = \frac{\cos(12x) - 1}{72x^2}$                    | $; a = 0$ |
| ⑫ | $f(x) = \frac{6x^2 + 2 - 2\cos(2x)}{2x^2}$              | $; a = 0$ |
| ⑬ | $f(x) = \frac{\sin(x-1)}{x^2 + x - 2}$                  | $; a = 1$ |
| ⑭ | $f(x) = \frac{1 - \cos(4x)}{6x^3 - 4x}$                 | $; a = 0$ |
| ⑮ | $f(x) = \frac{\cos 3x - \cos 4x}{x \sin(2x)}$           | $; a = 0$ |
| ⑯ | $f(x) = \frac{\cos^2 x - \cos x}{1 - \cos x}$           | $; a = 0$ |
| ⑰ | $f(x) = \frac{2\cos x - 2}{\sqrt{4x^2 + 2} - \sqrt{2}}$ | $; a = 0$ |