

## إجابات تدريبات الدرس

### نهايات اقترانات مثلثية

#### تدريب ١

جد كلاً من النهايات الآتية:

$$(١) \lim_{s \rightarrow \pi} \frac{\sin 7s}{\sin 3s}$$

$$(٢) \lim_{s \rightarrow \pi} \frac{\sin(\pi - s)}{\sin(\pi - s)}$$

$$(٣) \lim_{s \rightarrow \pi} \frac{\sin 9s}{\sin 3s}$$

$$(٤) \lim_{s \rightarrow \frac{\pi}{4}} \frac{\sin s}{\sin s}$$

الحل:

$$(١) \lim_{s \rightarrow \pi} \frac{\sin 7s}{\sin 3s} = \frac{\sin 7\pi}{\sin 3\pi} = \frac{0}{0}$$

$$(٢) \lim_{s \rightarrow \pi} \frac{\sin(\pi - s)}{\sin(\pi - s)} = \frac{\sin(\pi - \pi)}{\sin(\pi - \pi)} = \frac{0}{0}$$

$$(٣) \lim_{s \rightarrow \pi} \frac{\sin 9s}{\sin 3s} = \frac{\sin 9\pi}{\sin 3\pi} = \frac{0}{0}$$

$$(٤) \lim_{s \rightarrow \frac{\pi}{4}} \frac{\sin s}{\sin s} = \frac{\sin \frac{\pi}{4}}{\sin \frac{\pi}{4}} = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$$

$$(٤) \lim_{s \rightarrow \frac{\pi}{4}} \frac{\sin s}{\sin s} = \frac{\sin \frac{\pi}{4}}{\sin \frac{\pi}{4}} = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$$

$$\frac{\sqrt{2}}{2} = \frac{1}{\frac{\sqrt{2}}{2}} = \frac{2}{\sqrt{2}} = \sqrt{2}$$

الحل:



بالقسمة على س

$$\frac{\frac{3}{\sin} + \frac{5\cos}{\sin} - \frac{\sin}{\sin}}{\frac{3}{\sin} - \frac{5\cos}{\sin}}$$



$$\frac{3}{\sin} = \frac{0 + 3 - 1}{\frac{3}{\sin} \times \frac{3}{\sin} - 5\cos}$$

$$1 = \frac{2}{3\sin}$$

تدريب ٣

جد كلاً مما يأتي:



(١) نهايا  $\frac{1 - \cos}{\sin}$       (٢) نهايا  $\frac{\sin + \cos}{\sin}$

الحل:



(١) نهايا  $\frac{1 - \cos}{\sin} = \frac{1 - \cos}{\sin} \times \frac{1 + \cos}{1 + \cos}$

نهايا  $\frac{\sin}{\sin} \times \frac{1 - \cos^2}{\sin} = \frac{1 - \cos^2}{\sin}$

$1 = \frac{1 - \cos^2}{\sin}$



(٢) نهايا  $\frac{\sin + \cos}{\sin} = \frac{\sin + \cos}{\sin}$

$12 = 6 + 8 = \frac{\sin}{\sin} + \frac{\cos}{\sin}$

### تدريب ٤

جد كلاً مما يأتي:

$$(1) \text{ نهايا } \frac{\text{جتا } \frac{\pi}{3}}{\text{س } \frac{\pi}{4}} \text{ جتا } \frac{\pi}{4}$$

$$(2) \text{ نهايا } \frac{\text{جتا } \frac{\pi}{2}}{\text{س } 1} \text{ س } 1$$

الحل:

$$(1) \text{ نهايا } \frac{\text{جتا } \frac{\pi}{3}}{\text{س } \frac{\pi}{4}} = \frac{\text{نهايا } \frac{\pi}{3}}{\frac{\text{س } \frac{\pi}{4}}{\text{س } \frac{\pi}{4}}} = \frac{\frac{\sqrt{3}}{2}}{\frac{\sqrt{2}}{2}}$$

$$= \frac{\sqrt{3}}{\sqrt{2}} = \frac{\sqrt{3} \cdot \sqrt{2}}{\sqrt{2} \cdot \sqrt{2}} = \frac{\sqrt{6}}{2}$$

$$(2) \text{ نهايا } \frac{\text{جتا } \frac{\pi}{2}}{\text{س } 1} = \frac{\frac{0}{1}}{1} = 0$$

$$\text{نهايا } \frac{\text{جتا } (1 - \frac{\pi}{2})}{\text{س } 1} = \frac{\frac{0}{1}}{1} = 0$$

$$\text{نهايا } \frac{\text{جتا } \frac{\pi}{2}}{\text{س } 1} = \frac{\frac{0}{1}}{1} = 0$$

$$\begin{cases} \text{س } 1 = 1 \\ \text{س } 1 = 1 \\ \text{س } 1 = 1 \end{cases}$$