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| <p>الف) <math>y = \sqrt{4 - x^2} \Rightarrow 4 - x^2 \geq 0 \Rightarrow x^2 \leq 4</math><br/><math>\Rightarrow x^2 \leq 2</math></p> <p><math>\frac{-\sqrt{2}}{-} + \frac{\sqrt{2}}{+} -</math> <math>[-\sqrt{2}, \sqrt{2}]</math></p> <p style="text-align: center;">(2) ✓</p>                                                                                                                                                                                                                                                                   | <p>ب) <math>y = \sqrt{x x+1 } \Rightarrow x x+1  \geq 0 \Rightarrow  x  \geq 1</math><br/><math>\Rightarrow x \leq -1 \leq x \geq 1 \Rightarrow (-\infty, -1] \cup [1, \infty)</math><br/><math>x \leq -1 \leq x \geq 1</math></p> <p><math>\frac{-1}{+} \frac{1}{-} \frac{+}{+}</math></p> <p style="text-align: right;">6 ✓</p>                                                                                            |                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p>الف) <math>y = \sqrt{\frac{ x +1}{ x -2}} \Rightarrow \frac{ x +1}{ x -2} \geq 0</math><br/><math>\Rightarrow  x -2 &gt; 0 \Rightarrow  x  &gt; 2 \Rightarrow x &lt; -2 \text{ or } x &gt; 2</math><br/><math>(-\infty, -2) \cup (2, \infty)</math><br/><math> x  \neq 2 \Rightarrow x \neq \pm 2</math><br/><math>D_f = \mathbb{R} - \{\pm 2\}</math><br/><math>x &lt; -2 \leq x &gt; 2</math></p> <p><math>\frac{-2}{+} \frac{2}{-} \frac{+}{+}</math> <math>D_f = \mathbb{R} - \{\pm 2\}</math></p> <p style="text-align: center;">(2) ✓</p> | <p>ب) <math>y = \sqrt{\frac{\sqrt{x}+1}{\sqrt{x}-3}} \Rightarrow \frac{\sqrt{x}+1}{\sqrt{x}-3} \geq 0 \Rightarrow \sqrt{x}-3 &gt; 0</math><br/><math>\Rightarrow \sqrt{x} &gt; 3 \Rightarrow x &gt; 9 \Rightarrow (9, \infty)</math><br/><math>\sqrt{x} \neq 3 \Rightarrow x \neq 9</math><br/><math>D_f = [0, +\infty) - \{9\}</math></p> <p><math>\frac{9}{-} \frac{+}{+}</math></p> <p style="text-align: right;">7 ✓</p> |                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p>الف) <math>y = \frac{\sin x}{x \cos x - 1}</math><br/><math>x \cos x - 1 \neq 0 \Rightarrow \cos x \neq \frac{1}{x}</math><br/><math>x \neq \frac{1}{\cos x} \pm \frac{\pi}{2} \Rightarrow (k \in \mathbb{Z})</math><br/><math>x \neq \frac{1}{\cos x} \pm \frac{\pi}{2}</math></p> <p><math>\frac{1}{+} \frac{-\pi/2}{-} \frac{+}{+}</math></p>                                                                                                                                                                                                | <p>ب) <math>y = \frac{\cos x + 1}{x \sin x + 1}</math><br/><math>x \sin x + 1 \neq 0 \Rightarrow \sin x \neq -\frac{1}{x}</math><br/><math>x \neq \frac{1}{\sin x} - \frac{\pi}{2}</math><br/><math>x \neq \frac{1}{\sin x} - \frac{\pi}{2}</math></p> <p><math>\frac{1}{+} \frac{-\pi/2}{-} \frac{+}{+}</math></p> <p style="text-align: center;">(1)</p>                                                                   | <p>ج) <math>y = \frac{\tan x + 1}{\cot x - 1}</math><br/><math>\cos x \neq 0, \sin x \neq 0</math><br/><math>\cot x - 1 \neq 0 \Rightarrow \cot x \neq 1</math><br/><math>x \neq \frac{\pi}{4} + k\pi</math><br/><math>x \neq \frac{\pi}{4} + k\pi</math><br/><math>x \neq \frac{\pi}{4} + k\pi</math></p> <p><math>\frac{\pi/4}{-} \frac{+}{+} \frac{+}{+}</math></p> | <p>د) <math>y = \frac{\sin x + 1}{x \sin x - 1}</math><br/><math>\sin x + 1 \neq 0 \Rightarrow \sin x \neq -1</math><br/><math>x \neq \frac{3\pi}{2} + 2k\pi</math><br/><math>x \sin x - 1 \neq 0 \Rightarrow \sin x \neq \frac{1}{x}</math><br/><math>x \neq \frac{1}{\sin x} \pm \frac{\pi}{2}</math><br/><math>x \neq \frac{1}{\sin x} \pm \frac{\pi}{2}</math></p> <p><math>\frac{3\pi/2}{-} \frac{+}{+} \frac{+}{+} \frac{+}{+}</math></p> <p style="text-align: right;">8 ✓</p> |
| <p><math>y = \frac{1}{\sqrt{x x-2  - \frac{1}{x}}} \Rightarrow x x-2  - \frac{1}{x} &gt; 0 \Rightarrow x x-2  &gt; \frac{1}{x} \Rightarrow  x-2  &gt; \frac{1}{x^2}</math><br/><math>x &gt; \frac{1}{x^2} \Rightarrow x^3 &gt; 1 \Rightarrow x &gt; 1</math><br/><math>x &lt; -\frac{1}{x^2} \Rightarrow x^3 &lt; -1 \Rightarrow x &lt; -1</math><br/><math>(-\infty, -1) \cup (1, \infty)</math></p> <p><math>\frac{1}{+} \frac{1}{+} \frac{+}{+}</math></p> <p style="text-align: center;">(1)</p>                                               | <p>ب) <math>y = \sqrt{\frac{ x }{ x }} \Rightarrow  x  \neq 0 \Rightarrow x \neq 0</math><br/><math>\frac{ x }{ x } = 1</math><br/><math>(-\infty, 0) \cup (0, \infty)</math></p> <p><math>\frac{0}{+} \frac{+}{+}</math></p> <p style="text-align: right;">10 ✓</p>                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <p>الف) <math>y = \sqrt{4 - x^2} \Rightarrow 4 - x^2 \geq 0 \Rightarrow x^2 \leq 4</math><br/><math> x  \leq 2 \Rightarrow [-2, 2]</math></p> <p><math>\frac{-2}{-} \frac{2}{+}</math></p> <p style="text-align: center;">(2) ✓</p>                                                                                                                                                                                                                                                                                                                | <p>ب) <math>y = \sqrt{\frac{ x }{ x }} \Rightarrow  x  \neq 0 \Rightarrow x \neq 0</math><br/><math>\frac{ x }{ x } = 1</math><br/><math>(-\infty, 0) \cup (0, \infty)</math></p> <p><math>\frac{0}{+} \frac{+}{+}</math></p> <p style="text-align: right;">10 ✓</p>                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |