

|                                                                                                                                                                                                                                                                                                           |  |                                                                                                                                                                                                                    |  |   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---|
| الف)                                                                                                                                                                                                                                                                                                      |  | ب)                                                                                                                                                                                                                 |  | ۱ |
| ج)                                                                                                                                                                                                                                                                                                        |  | د)                                                                                                                                                                                                                 |  | ۱ |
| الف) $x^2 - 5x + 6 > 0$ $(-\infty, 2) \cup (3, +\infty)$<br>$(x-2)(x-3) > 0$<br>2 ← 3<br>+ 0 - 0 +                                                                                                                                                                                                        |  | ب) $x^2 - 4x + 5 < 0$ $(1, 5)$<br>$(x-0)(x-1) < 0$<br>0 ← 1<br>+ 0 - 0 +                                                                                                                                           |  | ۲ |
| ج) $x^2 + 4x + 5 \geq 0$ $(-\infty, -5) \cup (-1, +\infty)$<br>$(x+5)(x+1) \geq 0$<br>-5 ← -1<br>+ 0 - 0 +                                                                                                                                                                                                |  | د) $x^2 - 7x + 6 \leq 0$ $[1, 6]$<br>$(x-1)(x-6) \leq 0$<br>1 ← 6<br>+ 0 - 0 +                                                                                                                                     |  | ۲ |
| الف) $\frac{x^2 - 2x + 2}{x-0} < 0 \Rightarrow \frac{(x-2)(x-1)}{(x-0)} < 0$<br>1 2 0<br>- 0 + 0 - 0 +<br>$(2, 0) \cup (-\infty, 1)$                                                                                                                                                                      |  | ب) $\frac{x^2 - 1}{x^2 - 4x + 6} \geq 0 \Rightarrow \frac{(x-1)(x+1)}{(x-0)(x-1)} \geq 0$<br>-1 1 0<br>+ 0 - 0 - 0 +<br>$(-\infty, -1] \cup (0, +\infty)$                                                          |  | ۳ |
| الف) $y = \sqrt{\frac{x^2 - 1}{x^2 - 2}}$ $\frac{x^2 - 1}{x^2 - 2} \geq 0$<br>$\frac{x^2 - 1}{x(x^2 - 1)} \geq 0 \Rightarrow \frac{(x^2 - 1)}{x(x-1)(x+1)} \geq 0$ $D_f = (-\infty, -1) \cup (-1, 1) \cup (1, +\infty)$<br>-1 0 1<br>+ 0 - 0 + 0 +<br>$D_f = (-\infty, -1) \cup (0, 1) \cup (1, +\infty)$ |  | ب) $y = \sqrt{\frac{x^2 - 14}{x^2 - 5x + 6}}$ $\frac{x^2 - 14}{x^2 - 5x + 6} \geq 0$<br>$\frac{(x-4)(x+4)}{(x-2)(x-3)} \geq 0$<br>-4 1 2 3<br>+ 0 - 0 + 0 +<br>$D_f = (-\infty, -4) \cup (1, 2) \cup (3, +\infty)$ |  | ۴ |
| الف) $y = \sqrt{4 - \sqrt{2-x}}$ $4 - \sqrt{2-x} \geq 0 \Rightarrow \sqrt{2-x} \leq 4 \Rightarrow 2-x \leq 16 \Rightarrow x \geq -14$<br>$2-x \geq 0 \Rightarrow x \leq 2$<br>$D_f = [-14, 2]$                                                                                                            |  | ب) $y = \sqrt{3 - \sqrt{2-x}}$ $3 - \sqrt{2-x} \geq 0 \Rightarrow \sqrt{2-x} \leq 3 \Rightarrow 2-x \leq 9 \Rightarrow x \geq -7$<br>$2-x \geq 0 \Rightarrow x \leq 2$<br>$D_f = [-7, 2]$                          |  | ۵ |

|                                                                                                                                                  |                                                                                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 61) $y = \sqrt{4-x^2}$<br>$4-x^2 \geq 0 \quad (x-\sqrt{4})(x+\sqrt{4}) \geq 0$<br>$x^2 \leq 4$<br>$x \leq 2$<br>$x^2 \leq 0 \quad D_f = [-2, 2]$ | 62) $y = \sqrt{3 x -9}$<br>$3 x -9 \geq 0$<br>$3 x  \geq 9$<br>$ x  \geq 3$<br>$x \leq -3 \cup x \geq 3$<br>$D_f = (-\infty, -3] \cup [3, +\infty)$ |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                                                            |                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| 63) $y = \sqrt{\frac{ x +1}{ x -1}}$<br>$ x -1 \neq 0$<br>$ x  \neq 1$<br>$x \neq \pm 1$<br>$D_f = \mathbb{R} - \{\pm 1\}$ | 64) $y = \sqrt{\frac{\sqrt{x}+1}{\sqrt{x}-1}}$<br>$x \geq 0$<br>$\sqrt{x}-1 \neq 0$<br>$\sqrt{x} \neq 1$<br>$x \neq 1$<br>$D_f = [0, +\infty) - \{1\}$ |
|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                                                               |                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 65) $y = \frac{\sin x}{1-\cos x}$<br>$1-\cos x \neq 0$<br>$\cos x \neq 1$<br>$x \neq 2k\pi$<br>$D_f = \mathbb{R} - \{2k\pi\}$ | 66) $y = \frac{\cos x + 1}{1-\sin x}$<br>$1-\sin x \neq 0$<br>$\sin x \neq 1$<br>$x \neq \frac{\pi}{2} + 2k\pi$<br>$D_f = \mathbb{R} - \{\frac{\pi}{2} + 2k\pi\}$ |
|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                                                                              |                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 67) $y = \frac{\tan x + 1}{\cot x - 1}$<br>$\cot x \neq 1$<br>$x \neq \frac{\pi}{4} + k\pi$<br>$D_f = \mathbb{R} - \{\frac{\pi}{4} + k\pi\}$ | 68) $y = \frac{\sin x + 1}{1-\sin^2 x}$<br>$1-\sin^2 x \neq 0$<br>$\sin^2 x \neq 1$<br>$\sin x \neq \pm 1$<br>$x \neq \frac{\pi}{2} + k\pi$<br>$D_f = \mathbb{R} - \{\frac{\pi}{2} + k\pi\}$ |
|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                             |                                                                                             |
|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| $y = \frac{1}{\sqrt{1-x^2}}$<br>$1-x^2 > 0$<br>$ x  < 1$<br>$-1 < x < 1$<br>$D_f = (-1, 1)$ | $y = \frac{1}{\sqrt{1-x^2}}$<br>$1-x^2 > 0$<br>$ x  < 1$<br>$-1 < x < 1$<br>$D_f = (-1, 1)$ |
|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|

|                                                                                                   |                                                                                                                    |
|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| 69) $y = \sqrt{4- x }$<br>$4- x  \geq 0$<br>$ x  \leq 4$<br>$-4 \leq x \leq 4$<br>$D_f = [-4, 4]$ | 70) $y = \sqrt{\frac{ x }{ x +1}}$<br>$ x  \geq 0$<br>$ x +1 \neq 0$<br>$x \neq -1$<br>$D_f = \mathbb{R} - \{-1\}$ |
|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|