Solutions - Domain & Range

Question 1. Solution:

(a) $\mathcal{D} = \mathbb{R}$, $\mathcal{R} = \mathbb{R}$

(b) $\mathcal{D} = \mathbb{R}$, $\mathcal{R} = \mathbb{R}$

(c) $\mathcal{D} = \mathbb{R}$, $\mathcal{R} = 2 * * * *$ (I feel like some may have gotten this wrong)

(d) $\mathcal{D} = \mathbb{R}$, $\mathcal{R} = \mathbb{R}$

(e) $\mathcal{D} = \mathbb{R}$, $\mathcal{R} = \mathbb{R}$

(f) $\mathcal{D} = \mathbb{R}$, $\mathcal{R} = \mathbb{R}$

Question 2. Solution:

(a) $\mathcal{D} = \mathbb{R}$, $\mathcal{R} = \mathbb{R}$

(b) $\mathcal{D} = \mathbb{R}$, $\mathcal{R} = \{y \in \mathbb{R} \mid y \geq -\frac{25}{4}\}$

(c) $\mathcal{D} = \mathbb{R}$, $\mathcal{R} = \{y \in \mathbb{R} \mid y \leq -\frac{4}{3}\}$

(d) $\mathcal{D} = \mathbb{R}$, $\mathcal{R} = \{y \in \mathbb{R} \mid y \geq -9\}$

(e) $\mathcal{D} = \mathbb{R}$, $\mathcal{R} = \{y \in \mathbb{R} \mid y \leq 9\}$

(f) $\mathcal{D} = \mathbb{R}$, $\mathcal{R} = \{y \in \mathbb{R} \mid y \leq \frac{181}{100}\}$

Question 3. Solution:

(a) $\mathcal{D} = \mathbb{R}$, $\mathcal{R} = \{y \in \mathbb{R} \mid y \geq 0\}$

(b) $\mathcal{D} = \mathbb{R}$, $\mathcal{R} = \{y \in \mathbb{R} \mid y \leq -1\}$

(c) $\mathcal{D} = \mathbb{R}$, $\mathcal{R} = \{y \in \mathbb{R} \mid y \geq 2\}$

(d) $\mathcal{D} = \mathbb{R}$, $\mathcal{R} = \{y \in \mathbb{R} \mid y \geq \frac{5}{2}\}$

(e) $\mathcal{D} = \mathbb{R}$, $\mathcal{R} = \{y \in \mathbb{R} \mid y \leq 0\}$

Question 4. Solution:

(a) $\mathcal{D} = \{x \in \mathbb{R} \mid x \neq 0\}$, $\mathcal{R} = \{y \in \mathbb{R} \mid y \neq 0\}$

(b) $\mathcal{D} = \{x \in \mathbb{R} \mid x \neq \frac{1}{2}\}$, $\mathcal{R} = \{y \in \mathbb{R} \mid y \neq 3\}$

(c) $\mathcal{D} = \{x \in \mathbb{R} \mid x \neq 1\}$, $\mathcal{R} = \{y \in \mathbb{R} \mid y \neq -\frac{4}{3}\}$

(d) $\mathcal{D} = \{x \in \mathbb{R} \mid x \neq \frac{15}{4}\}$, $\mathcal{R} = \{y \in \mathbb{R} \mid y \neq -16\}$

(e) $\mathcal{D} = \{x \in \mathbb{R} \mid x \neq 0\}$, $\mathcal{R} = \{y \in \mathbb{R} \mid y \neq 0\}$

Question 5. Solution:

(a) $\mathcal{D} = \{x \in \mathbb{R} \mid x \geq 0\}$, $\mathcal{R} = \{y \in \mathbb{R} \mid y \geq 0\}$

(b) $\mathcal{D} = \{x \in \mathbb{R} \mid x \leq \frac{7}{5}\}$, $\mathcal{R} = \{y \in \mathbb{R} \mid y \leq 1\}$

(c) $\mathcal{D} = \{x \in \mathbb{R} \mid x \leq 0\}$, $\mathcal{R} = \{y \in \mathbb{R} \mid y \leq 0\}$

(d) $\mathcal{D} = \{x \in \mathbb{R} \mid x \geq -1\}$, $\mathcal{R} = \{y \in \mathbb{R} \mid y \geq -1\}$

Question 6. Solution:

(a) $\mathcal{D} = \{x \in \mathbb{R} \mid -9 \leq x \leq -5\}$, $\mathcal{R} = \{y \in \mathbb{R} \mid 0 \leq y \leq 4\}$

(b) $\mathcal{D} = \{x \in \mathbb{R} \mid -3 \leq x \leq 3\}$, $\mathcal{R} = \{y \in \mathbb{R} \mid -4 \leq y \leq 2\}$

(c) $\mathcal{D} = \{x \in \mathbb{R} \mid -10 \leq x \leq -8\}$, $\mathcal{R} = \{y \in \mathbb{R} \mid 3 \leq y \leq 5\}$

(d) $\mathcal{D} = \{x \in \mathbb{R} \mid -1 \leq x \leq 1\}$, $\mathcal{R} = \{y \in \mathbb{R} \mid -1 \leq y \leq 1\}$

(e) $\mathcal{D} = \{x \in \mathbb{R} \mid 4 \leq x \leq 6\}$, $\mathcal{R} = \{y \in \mathbb{R} \mid -4 \leq y \leq -2\}$
(I think I accidentally typed an $(x+3)^2$ instead of $(y+3)^2$).