

1.1.

1. $\{2, 3\}$
2. $\emptyset$
3. $\{-1 + \sqrt{2}, -1 - \sqrt{2}\}$
4. $\{1, 2, 3, 4, 5, 6\}$
5. $\{-2, -1, 0, 1, 2\}$
6. $\left\{1 + \frac{2}{\sqrt{3}}, 1 - \frac{2}{\sqrt{3}}\right\}$
7. $\{-3, -2, -1, 0, 1, 2, 3\}$
8. $\{1, 2, 3\}$
9. $\{-2, -1, 0, 1\}$
10. $\emptyset$ se $-2 < a < 2$; $\{a\}$ se $a = -2$ o $a = 2$,
 $\{a + \sqrt{a^2 - 4}, a - \sqrt{a^2 - 4}\}$ se $a < -2$ o $a > 2$

1.2.

1. $\emptyset, \{0\}, \{1\}, \{0, 1\}$
2. $\emptyset, \{1\}, \{2\}, \{1, 2\}$
3. $\emptyset$
4. $\emptyset, \{\emptyset\}$
5. $\emptyset, \{-1\}$
6. Non è un insieme
7. $\emptyset, \{-2\}$
8. $\emptyset, \{1\}, \{4\}, \{-1\}, \{1, 4\}, \{1, -1\}, \{4, -1\}, \{1, 4, -1\}$
9. $\emptyset, \{1\}$
10. $\emptyset, \{5\}, \{7\}, \{5, 7\}$

1.3.

1. $A \cup B = \{1, 2, 3, 4, 5\}$, $A \cap B = \{1, 3\}$, $A - B = \{2, 4\}$
2. $A \cup B = \{1, 3, 5, 7, 9, 21\}$, $A \cap B = \{1, 5\}$, $A - B = \{3, 7\}$
3. $A \cup B = A$, $A \cap B = B$, $A - B = \{0, -1, -2, -3\}$
4. $A \cup B = \mathbf{R}^- \cup \{2\}$, $A \cap B = \{-1\}$, $A - B = \{2\}$
5. $A \cup B = \mathbf{N}$, $A \cap B = \emptyset$, $A - B = A = \{1, 2, 3\}$
6. $A \cup B = \{1, 2, 3\}$, $A \cap B = \{1, 2, 3\}$, $A - B = \emptyset$
7. $A \cup B = \{-\sqrt{2}, \sqrt{2}\}$, $A \cap B = \emptyset$, $A - B = \emptyset$

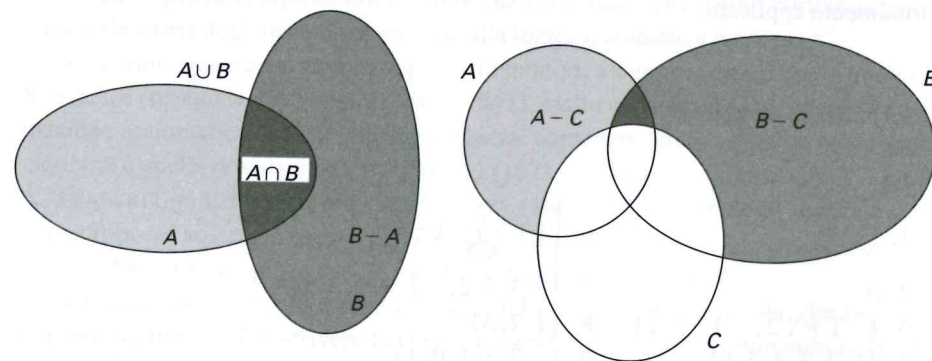
1.4.

1. $A \cap (B \cup C) = A$, $(A - B) \cap C = \{1, 3\}$, $(A \cup B) - C = \{2, 6\}$
2. $A \cap (B \cup C) = \{-1, 2\}$, $(A - B) \cap C = \emptyset$, $(A \cup B) - C = \{-1, 0, 1\}$
3. $A \cap (B \cup C) = \mathbf{N}$, $(A - B) \cap C = \emptyset$, $(A \cup B) - C = \mathbf{Q}^+ - \mathbf{N}$
4. $A \cap (B \cup C) = \{1\}$, $(A - B) \cap C = \{1\}$, $(A \cup B) - C = \mathbf{R} - \{1\}$
5. $A \cap (B \cup C) = \{0\}$, $(A - B) \cap C = \{0\}$, $(A \cup B) - C = \emptyset$

1.5.

1-5

6



1.6.

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|------|------|------|------|-------|-------|
| 1. V | 4. F | 6. V | 8. F | 10. V | 12. F |
| 2. F | 5. F | 7. V | 9. V | 11. F | 13. V |
| 3. V | | | | | |

1.7.

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|------|------|------|------|-------|-------|
| 1. V | 3. V | 5. V | 7. F | 9. F | 11. V |
| 2. V | 4. F | 6. V | 8. V | 10. V | |

1.8.

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|-----------------------------------|------------------|--|--|
| 1. $\mathcal{P} \vee \mathcal{Q}$ | 2. $\mathcal{P}$ | 3. $\neg \mathcal{P} \vee \mathcal{Q}$ | 4. $\neg \mathcal{P} \vee (\mathcal{P} \wedge \neg \mathcal{Q})$ |
|-----------------------------------|------------------|--|--|

1.9.

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|--|---|
| 1. $\mathcal{Q} \vee \mathcal{P}$ | 3. $\neg(\neg(\neg \mathcal{P} \vee \mathcal{Q}) \vee \neg(\neg \mathcal{Q} \vee \mathcal{P}))$ |
| 2. $\neg(\neg \mathcal{P} \vee \mathcal{Q})$ | 4. $\neg(\neg(\mathcal{P} \vee \mathcal{Q}) \vee \neg(\neg \mathcal{P} \vee \neg \mathcal{Q}))$ |

1.10.

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|---|---|
| 1. $\neg(\neg \mathcal{Q} \wedge \neg \mathcal{P})$ | 3. $\neg(\mathcal{P} \wedge \neg \mathcal{Q}) \wedge \neg(\mathcal{Q} \wedge \neg \mathcal{P})$ |
| 2. $\neg(\neg \mathcal{P} \wedge \mathcal{Q})$ | 4. $\neg(\neg \mathcal{P} \wedge \neg \mathcal{Q}) \wedge \neg(\mathcal{P} \wedge \mathcal{Q})$ |

1.11.

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|------|------|------|------|-------|
| 1. F | 3. F | 5. F | 7. V | 9. V |
| 2. V | 4. V | 6. V | 8. F | 10. V |

1.12.

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|---------------------------------|-------------------------------------|--------------------------------|---------------------|
| 1. $\left\{\frac{3}{4}\right\}$ | 4. $x=5$ | 7. $x=\frac{1\pm\sqrt{17}}{4}$ | 10. $\{0, 2, -1\}$ |
| 2. $x=-\frac{1}{2}$ | 5. $\{1, 2\}$ | 8. $\{-2\}$ | 11. $x=\pm\sqrt{3}$ |
| 3. $\emptyset$ | 6. $\left\{1, -\frac{1}{3}\right\}$ | 9. $x=1\pm\sqrt{2}$ | 12. $\mathbf{R}^+$ |

1.13.

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|---------------------|-----------------------|--------------|-------------------------------------|
| 1. $x>-\frac{2}{3}$ | 4. $x\leq\frac{5}{2}$ | 7. $0<x<1$ | 10. $\mathbf{R}$ |
| 2. $x>\frac{1}{2}$ | 5. $-1<x<0$ | 8. $x<1$ | 11. $x\leq-\frac{1}{3}\vee x\geq 1$ |
| 3. $\emptyset$ | 6. $1<x\leq 2$ | 9. $-2<x<-1$ | 12. $x<0$ |

1.14.

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| 1. $\exists n\in\mathbf{N}: n>3$ | 8. $\forall q\in\mathbf{Q}, q^2\in\mathbf{Q}$ |
| 2. $\forall n\in\mathbf{N}, n^2>n$ | 9. $\forall q\notin\mathbf{Q}, q^2\notin\mathbf{Q}$ |
| 3. $\exists x\in\mathbf{R}: x<x^3$ | 10. $\exists q\notin\mathbf{Q}: q^2\notin\mathbf{Q}$ |
| 4. $\exists n\in\mathbf{N}: \forall k\in\mathbf{N}, n>k$ | 11. $\exists q\notin\mathbf{Q}, q^2\in\mathbf{Q}$ |
| 5. $\forall a\in\mathbf{Z} \exists n, k\in\mathbf{N}: a=n-k$ | 12. $\forall n\in\mathbf{N}, \sqrt[3]{n}\notin\mathbf{Q}$ |
| 6. $\forall x\in\mathbf{R} \exists p, q\in\mathbf{Q}: x=p+q$ | 13. $\forall x\in\mathbf{R}, x^2>1\Rightarrow x>1$ |
| 7. $\forall x\in\mathbf{R}, x+3=0\Leftrightarrow x=-3$ | 14. $\forall x\in\mathbf{R}, x>1\Rightarrow x^2>1$ |

1.15.

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|------------------|----------------------|
| 1. V | 8. V |
| 2. F ($1^2=1$) | 9. F |
| 3. V (2) | 10. V |
| 4. F | 11. V |
| 5. V | 12. F |
| 6. F | 13. F ($(-2)^2>1$) |
| 7. V | 14. V |

1.16.

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| 1. $\forall n\in\mathbf{N}, n\leq 3$ | 8. $\exists q\in\mathbf{Q}: q^2\notin\mathbf{Q}$ |
| 2. $\exists n\in\mathbf{N}: n^2\leq n$ | 9. $\exists q\notin\mathbf{Q}: q^2\in\mathbf{Q}$ |
| 3. $\forall x\in\mathbf{R}, x\geq x^3$ | 10. $\forall q\notin\mathbf{Q}, q^2\in\mathbf{Q}$ |
| 4. $\forall n\in\mathbf{N} \exists k\in\mathbf{N}: n\leq k$ | 11. $\forall q\notin\mathbf{Q}, q^2\notin\mathbf{Q}$ |
| 5. $\exists a\in\mathbf{Z}: \forall n, k\in\mathbf{N}, a\neq n-k$ | 12. $\exists n\in\mathbf{N}: \sqrt[3]{n}\in\mathbf{Q}$ |
| 6. $\exists x\in\mathbf{R}: \forall p, q\in\mathbf{Q}, x\neq p+q$ | 13. $\exists x\in\mathbf{R}: x^2>1\wedge x\leq 1$ |
| 7. $\exists x\in\mathbf{R}: x+3=0\wedge x\neq -3$ | 14. $\exists x\in\mathbf{R}: x>1\wedge x^2\leq 1$ |