1](a) $(\pi > 0) \wedge (\pi < 10)$

  ↳ $\boxed{0 < \pi < 10}$

(b) $(p \geq 7) \wedge (p < 12)$

  $\boxed{7 \leq p < 12}$

(c) $(x > 5) \wedge (x < 7)$ → $\boxed{5 < x < 7}$

(d) $(x < 4) \wedge (x < 6)$ → $\boxed{x < 4}$

(e) $(y < 4) \wedge (y^2 < 9)$

  ↳ $(y < 4) \wedge (y > -3) \wedge (y < 3)$

   $\boxed{-3 < y < 3}$

(f) $(x \geq 0) \wedge (x \leq 0)$ $\boxed{x = 0}$

2](a) 0 is less than π and π is less than 10

(b) 7 is less than or equal to p and p is less than 12

(c) 5 is less than x and x is less than 7

(d) x is less than 4

(e) -3 is less than y and y is less than 5

(f) x is 0

3] To prove that $\phi_1 \wedge \phi_2 \wedge \cdots \wedge \phi_n$ is true, prove ϕ_p is true $\forall p \in [1,n]$

4] To prove that $\phi_1 \wedge \phi_2 \wedge \cdots \wedge \phi_n$ is false, prove $\exists p \in [1,n]$ such that ϕ_p is false.

5] $(\pi > 3) \vee (\pi > 10)$ → $\boxed{\pi > 3}$

(b) $(x < 0) \vee (x > 0)$ → $\boxed{\{x \in \mathbb{R} \mid x \neq 0\}}$

(c) $\boxed{x \geq 0}$ d] $\boxed{x \geq 0}$

(e) $(x > 3) \vee [(x > 3) \cancel{\wedge} (x < -3)]$

    $x > 3 \vee x < -3$

  $\cancel{x > 3 \wedge x < -3 \neq \forall x}$

6](a) π is greater than 3

(b) x is not equal to 0

(c) x is greater than or equal to 0

(d) " " (e) x is greater than 3 or x is less than -3.

7] $\phi_1 \vee \phi_2 \vee \cdots \vee \phi_n$ is true if $\exists p \in [1,n]$ such that ϕ_p is true.

8] $\phi_1 \vee \phi_2 \vee \cdots \vee \phi_n$ is false is ϕ_p is false $\forall p \in [1,n]$

9](a) $\pi \leq 5.2$ (b) $x \geq 0$ (c) $\boxed{x = 0}$

(d) $x \neq 1$ (e) ψ

10](a) π is less than or equal to 5.2.

(b) x is greater than or equal to 0

(c) x is zero

(d) x is not 1

(e) ψ.

11) $D =$ "The dollar is strong"

$Y =$ "The Yuan is strong"

$T =$ "New US-China trade agreement
signed"

(a) $D \wedge Y$ (b) $T \wedge \neg Y \wedge D$

(c) $\neg (D \wedge Y)$

(d) $T \wedge D \wedge Y$

(e) $\neg T \wedge D \wedge Y$