

Epp 2nd Ed. 2.3 2, 5 – 9, 11 – 14, 20, 21, 22, 26, 28.

- (2) If an integer
- n
- equals
- $2k$
- and
- $k \in \mathbb{Z}$
- , then
- n
- is even.

 $0 = 2 \cdot 0$ and 0 is an integer. \therefore 0 is even

- (5) All healthy people eat an apple a day.

Harry does not eat an apple a day.

 \therefore Harry is not healthy



- (6) If a program is correct, then compilation does not produce error messages.


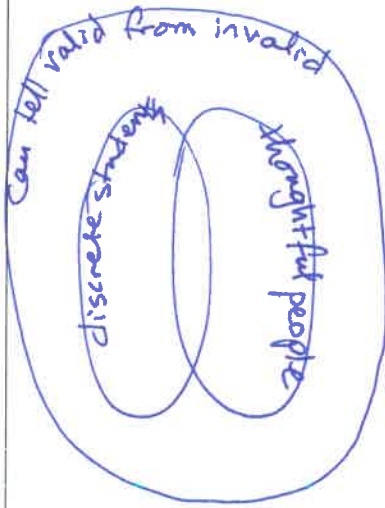

Compilation of this program produces error messages.


 \therefore the program is not correct.

		Valid or Invalid?	Justify your answer! • Summarize the argument using symbols.	<ul style="list-style-type: none"> If the argument is valid, say if it is by the conditional or the contrapositive. If it's invalid, say if it is the inverse error or the converse error.
(7)	All healthy people eat on apple a day. Helen eats an apple a day. \therefore Helen is a healthy person.	invalid	Let $H(x)$: healthy, and $A(x)$: eats apples. $H(x) \Rightarrow A(x)$ $A(\text{Helen})$ $\therefore H(\text{Helen})$	Converse error!
(8)	All freshmen take writing. Caroline is a freshman. \therefore Caroline must take writing.	valid	Let $F(x)$: is a freshman, and $W(x)$: takes writing. $F(x) \Rightarrow W(x)$ $F(\text{Carolyn})$ $\therefore W(\text{Carolyn})$	conditional
(9)	All healthy people eat on apple a day. Herbert is not a healthy person \therefore Herbert does not eat an apple a day.	invalid	Let $H(x)$: healthy, and $A(x)$: eats apples. $H(x) \Rightarrow A(x)$ $\sim H(\text{Herbert})$ $\therefore \sim A(\text{Herbert})$	inverse error!

(11)	All cheaters sit in the back row. George sits in the back row. \therefore George is a cheater.	invalid	Let $C(x)$: is cheater, and $B(x)$: sits in back row. $C(x) \Rightarrow B(x)$ $B(\text{George})$ $\therefore C(\text{George})$	Converse error.
(12)	All honest people pay their taxes. Darth is not honest. \therefore Darth does not pay his taxes.	invalid	Let $H(x)$: honest, and $T(x)$: pays taxes $H(x) \Rightarrow T(x)$ $\sim H(\text{Darth})$ $\therefore \sim T(\text{Darth})$	inverse error
(13)	For all students x , if x studies discrete math, then x is good at logic. Dawn studies discrete math. \therefore Dawn is good at logic.	valid	Let $D(x)$: discrete math, and $G(x)$: good at logic $D(x) \Rightarrow G(x)$ $D(\text{Dawn})$ $\therefore G(\text{Dawn})$	Conditional
(14)	If compilation produces error messages, then the program is not correct. Compilation of this program did not produce error messages. \therefore Program is correct.	invalid	Let $E(x)$: errors, and $C(x)$: correct. $E(x) \Rightarrow C(x)$ $\sim E(\text{this program})$ $\therefore \sim C(\text{this program})$	inverse error

		Valid or Invalid?	Justify your answer! • Summarize the argument by drawing a diagram.	• If the argument is invalid, explain why.
(20a)	All dogs are carnivorous. Felix is not a dog. \therefore Felix is not carnivorous.	invalid		We're not sure where Felix is! (inverse error)
(20b)	$\forall x$, if $P(x)$, then $Q(x)$. $\sim P(a)$ for a particular a . $\therefore \sim Q(a)$.	invalid		We're not sure where $\sim P(a)$ is! (inverse error)

(21)	<p>All people are mice.</p> <p>All mice are mortal.</p> <p>\therefore All people are mortal.</p>	valid		
(22)	<p>All discrete math students can tell valid from invalid.</p> <p>All thoughtful people can tell valid from invalid.</p> <p>\therefore All discrete math students are thoughtful.</p>	invalid		<p>We're not sure of the relationship between discrete and thoughtful.</p>
(26)	<p>Nothing intelligible ever puzzles me.</p> <p>Logic puzzles me.</p> <p>\therefore Logic is unintelligible.</p>	valid		


 This is one way to draw the picture - see last page for others -

Now do problem 28. Write down the clues in order, and write down your intermediate conclusions.

(2) The arguments in these examples are not arranged in the regular order that I am used to.

(4) I can't understand examples if the arguments are not arranged in regular order like the ones I'm used to.

\therefore I can't understand these examples!

(1) When I work a logic example without grumbling, you may be sure that it is one I understand.
translation: If I do not grumble, then I understand.

\therefore These examples make me grumble (by contrapositive)

(5) I never grumble at an example unless it gives me a headache.

\therefore The examples give me a headache.

(3) No easy examples make my head ache.
Translation: if easy, then no headache.

\therefore These examples are not easy. (by contrapositive)

Other ^{VALID} ways to draw (26):

Nothing intelligible ever puzzles me.

Logic puzzles me.

∴ Logic is unintelligible.

