Practice Set on Biconditional Statements (p ↔ q)

Q1

Let p: "A number is divisible by 2."

Let q: "The number is even."

Expression: p ↔ q

English: "A number is divisible by 2. if and only if The number is even."

Truth Table:

p	q	p ↔ q
T	T	T
T	F	F
F	T	F
F	F	T

Q2

Let p: "You pass the driving test."

Let q: "You get a driving license."

Expression: p ↔ q

English: "You pass the driving test. if and only if You get a driving license."

Truth Table:

p	q	p ↔ q
T	T	T
T	F	F
F	T	F

F	F	T

Q3

Let p: "Today is Sunday."

Let q: "The library is closed."

Expression: p ↔ q

English: "Today is Sunday. if and only if The library is closed."

Truth Table:

p	q	p ↔ q
T	T	T
T	F	F
F	T	F
F	F	T

Q4

Let p: "The triangle is equilateral."

Let q: "All its sides are equal."

Expression: p ↔ q

English: "The triangle is equilateral. if and only if All its sides are equal."

Truth Table:

p	q	p ↔ q
T	T	T
T	F	F
F	T	F
F	F	T

Q5

Let p: "You enter the club."

Let q: "You show your ID."

Expression: $p \leftrightarrow q$

English: "You enter the club. if and only if You show your ID."

Truth Table:

p	q	$p \leftrightarrow q$
T	T	T
T	F	F
F	T	F
F	F	T

Q6

Let p: "The shape is a square."

Let q: "It has four equal sides and four right angles."

Expression: $p \leftrightarrow q$

English: "The shape is a square. if and only if It has four equal sides and four right angles."

Truth Table:

p	q	$p \leftrightarrow q$
T	T	T
T	F	F
F	T	F
F	F	T