

# INDEX

## Symbols

$(p, q)$ -shuffle, 8

$\text{Alt}^k(V)$ , 7

$k$ -linear, 7

$p$ -boundary, 26

$p$ -cycle, 26

$p$ -forms, 19

## A

alternating

algebra, 11

map, 7

## B

boundary, 26

## C

category, 27

chain complex, 25

chain homotopic, 30

chain homotopy, 31

closed  $p$ -form, 19

cohomology classes, 26

cokernel, 25

contractibility, 37

contravariant functor, 13, 19

covariant functor, 27

cycle, 26

## D

de Rham complex, 17

derivation, 17

DGA, 17

diffeomorphism, 41

differential, 17

$p$ -form, 15

exterior, 15

graded algebra, 17

direct sum, 26

divergence, 3

## E

energy, 5

exact, 25

exact  $p$ -forms, 19

exact sequences, 25

exterior algebra, 11

exterior differential, 15

exterior product, 8

## F

functor

contravariant, 13, 27

covariant, 27

## G

gradient, 2

## H

Homotopy, 37

homotopy

equivalence, 37

inverse, 37

type, 37

homotopy equivalence, 37

homotopy equivalent, 37

homotopy inverse, 37

homotopy types, 37

## I

invariance

topological, 40

## M

Mayer-Vietoris sequence, 35

multilinear, 7

## P

principal, 33

## R

rotation, 2, 3

## S

sequence

exact, 25

Mayer-Vietoris, 34