科技英语阅读教程

SCIENTIFIC ENGLISH
READING PRACTICE

（机械类）

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内 容 提 要

本书为机械工程类英语阅读文选。共选文章 21 篇。包括数学、力学、电工学、材料力学、工程材料、齿轮、减速器、机构学、液压传动元件、铸锻焊及热处理、计算机辅助制造等内容。供工科院校师生及工程技术人员阅读使用。

前　言

　　为了帮助工科院校师生和广大工程技术人员提高科技英语的阅读能力，同时也为了给工程技术人员晋升考核时，提供适用的复习资料。尤其在改革开放的今天，随着中外合资、引进设备、引进技术的日益增多，专业英语特别需要，于是我们便编写了此文选，作为阅读教程。

　　本文选系机械工程类，全书有课文21篇。分别选自与数学、力学、电工学、材料力学、工程材料、齿轮、减速器、机构学、液压传动元件、铸锻焊及热处理、计算机辅助制造等有关的原文书刊。每一课中有课文、生词、注释、参考译文。同时附有标准的专业术语，均以国标（GB）为准，以达到规范化、标准化，并附有一定的插图，直观醒目，便于学习掌握。最后一课为中英文对照的爱因斯坦生平简介，我们应学习他对科学事业的献身精神。

　　本书编著时得到潘光华先生的指导与帮助，审校了注释和译文，杨明炎、刘益荣同志审校了全书，在此深表谢意。

　　限于编者水平，书中不妥之处，敬请广大读者批评指正。

<div align="right">编　者</div>

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1. MATHEMATICS

Engels said, "Like all other sciences, mathematics arose out of the needs of men: from the measurement of land and the content of vessels, from the computation of time and from mechanics[1]".

In ancient Egypt every spring the waters of the Nile overflowed its banks and flooded the land for miles around[2]. The people welcomed this annual flood, for Egypt was a dry land. Their crops could be watered only in this way. But every time the floods came, the marks on the land were washed away[3]. So every year, after the water had gone, the Egyptians had to mark their lands again.

In order to measure their land, the Egyptians needed to use the right angle. They took a rope and tied 13 knots at equal intervals on the rope. They then tied it to three rods on the ground in the form of a triangle. One side of the triangle measured 5 units and the other sides measured 3 and 4 units. With this relationship of sides they could get a right angle.

Out of the need for the measurement of land arose the well-known theorem: "The square on the hypotenuse of a

right-angled triangle equals the sum of the squares on the
other two sides④"。

New Words and Expressions

mathematics [mæθi'mætiks] *n.*　　（复数，用作单或复数）数学

add [æd] *v.*　　加

minus ['mainəs] *prep.*　　减（去）；*a.* 负的；*n.* 负号

subtract [səb'trækt] *v.*　　减

multiply ['mʌltiplai] *v.*　　乘

divide [divaid] *v.*　　除，分

arise [ə'raiz]，arose [ə'rəuz]，arisen [ə'rizn] *vi.*　　升起；产生

need [ni:d] *n.*　　需要

say [sei]，said [sed] *vt.* ; *vi*　　说

measurement ['meʒəmənt] *n.*　　丈量，测量

content ['kɔntent] *n.*　　容量，含量

vessel ['vesl] *n.*　　器皿

computation ['kɔmpju:'teiʃən] *n.*　　计算

mechanics [mi'kæniks] *n.*　　（复数；用作单或复数）力学

ancient ['einʃənt] *a.*　　古代的

overflow ['əuvə'fləu] *vt.*　　涨满，泛滥

bank [bænk] *n.*　　（河、海或湖的）岸

flood [flʌd] *vt.*　　淹没；

　　　　　　　n.　　洪水，水灾

annual ['ænjuəl] *a.*　　每年的

dry [drai] *a.*　　干的；干旱的，干燥的

crop [krɔp] *n.*　　作物，庄稼

mark [ma:k] *n.*　　标记，记号

　　　　　　　vt.　　作记号于，标明

wash [wɔʃ] *vt.*　　洗；冲蚀

Egyptian [iˈdʒipʃən] *n.*	埃及人；
a.	埃及的
right [rait] *a.*	（角等）垂直的
angle [ˈæŋgl] *n.*	角
right angle	直角
rope [rəup] *n.*	绳，索
tie [tai] *vt.*	把（绳子）打结；（用带、绳等）系，拴
knot [nɔt] *n.*	（绳、带等的）结
equal [ˈiːkwəl] *a.*	相等的
vt.	等于
interval [ˈintəvəl] *n.*	间隔
unit [ˈjuːnit] *n.*	单位
relationship [riˈleiʃənʃip] *n.*	关系
well-known [ˈwelˈnəun] *a.*	著名的
theorem [θiərəm] *n.*	定理
square [skwɛə] *n.*	正方形；平方；
a.	正方形的
hypotenuse [haiˈpɔtinjuːz] *n.*	斜边
sum [sʌm] *n.*	总数；和
Engels [ˈeŋgəls]	恩格斯
Egypt [ˈiːdʒipt]	埃及
the Nile [nail]	尼罗河
at……intervals	每隔…距离（或时间）
in the form of	以…形式

Notes

① "Like all other sciences, mathematics arose out of the needs of men: from the measurement of land and the content

of vessels, from the computation of time and from mechanics".

"和其他一切科学一样,数学是从人的需要中产生的:是从丈量土地和测量容积,从计算时间和制造机械中产生的"。

②In ancient Egypt every spring the waters of the Nile overflowed its banks and flooded the land for miles around.

在古埃及,每年春天尼罗河的河水泛滥,淹没了沿岸数英里的土地。

这里的 waters 指河水,习惯上用复数形式。the Nile 指尼罗河。英语中常在河名前加定冠词。如 the Yangtse(长江)。

③But every time the floods came, the marks on the land were washed away.

但是,每次洪水来时,田地上的标记就被冲掉了。

这里的 every time 作连词用,引出时间状语从句。

④Out of the need for the measurement of land arose the well-known theorem: "The square on the hypotenuse of a right-angled triangle equals the sum of the squares on the other two sides".

由于丈量土地的需要,产生了著名的定理:"直角三角形的斜边平方等于其他两边的平方之和。"

本句是倒装句,主语是 theorem,谓语动词是 arose。后面引号中的话是主语的同位语,所以倒装是为了这一主语和它的同位语更加贴近,易于理解。right-angled 是一个复合形容词,由形容词加名词再加-(e)d 构成。

数 学 术 语
(Mathematics Terminology)

arithmetic	算术
number	数
digit	基数，位数
even number	偶数
odd number	奇数
decimal	小数
decimal point	小数点
recurring decimal	循环小数
fraction	分数
numerator	分子
denominator	分母
reciprocal	倒数
basic operations	基本运算
approximate calculation	近似计算
addition	加法
subtraction	减法
multiplication	乘法
division	除法
equal to	等于
greater than	大于
less than	小于
plus（minus，multiplication，division） sign	加（减乘除）号
positive（negative）sign	正（负）号
sum	和
difference	差

product	积
quotient	商
addend	加数
summand	被加数
subtrahend	减数
minuend	被减数
divisor	除数
dividend	被除数
multiplier	乘数
multiplicand	被乘数
brackets	括号
algebra	代数
coordinates	坐标
origin	原点
origin of coordinates	坐标原点
axis of abscissa	横轴
axis of ordinate	纵轴
negative number	负数
real number	实数
integer, whole number	整数
imaginary number	虚数
formula	公式
axiom	公理
theorem	定理
irrational number	无理数
variable	变量
positive number	正数
known number	已知数
unknown number	未知数
solution	解法，解式

monomial	单项式
polynomial	多项式
infinity	无穷大
infinitesimal	无穷小
trigonometry	三角
geometry	几何
plane geometry	平面几何
spherical geometry	球面几何
point	点
line	线
plane	面
straight line	直线
slant	斜线
symbol	符号，记号
perpendicular	垂直
parallel	平行
horizontal line	水平线
vertical line	垂直线
triangle	三角形
right angle	直角
acute angle	锐角
side	勾、股
right-angled triangle	直角三角形
square	正方形
quadrilateral	四边形
parallelogram	平行四边形
trapezoid	梯形
rectangle	长方形，矩形
rhombus	菱形
degree	度数

sector	扇形
cube	正方体
circular cylinder，cylinder	圆柱体
spheroid	球体
cone	圆锥体
section paper	方格纸
hyperbola	双曲线
parabola	抛物线
derivative	导数
differentiation	微分法
integration	积分法

2. MECHANICS

Whenever we see an object begin to move, we say that something is acting upon it to produce the motion. If that object is a car, we conclude that some one is pulling or pushing it, or the motor is playing the trick[1]. When we look out and see the leaves rustling, we would think that a wind is exerting a force upon them, otherwise the leaves would be stationary[2]. The only way a person can lift himself from a sitting position to a standing position is to pull or push on some object. Therefore experience has taught us that objects at rest remain at rest unless acted upon by some external force.

On the other hand, when we see a ball flying, we do not expect the ball to fly forever. We are sure that it will come to the ground and stop somewhere. A car has brakes to stop it quickly, but it would eventually come to rest even without such a device. In the case of either the ball or the car, if the ground on which they move is smooth, the ball or the car will travel faster and farther than they do when the ground is rough[3]. They will go still faster and farther over ice. It is now clear that as the opposing forces are reduced, the stop-

ping distance increases[④]. If all the opposing forces were removed, the ball or the car would continue to travel without end[⑤]. Now it may be stated that an object at rest remains at rest and an object in motion will continue moving without changing its velocity, unless it is acted upon by an external force. This property of matter to oppose any change in its motion is called inertia.

Inertia is evident in our everyday experiences. We pitch forward when the car in which we are riding is stopped suddenly, and effect is more evident while riding a bus in standing position. when the bus starts moving, our bodies seem to want to stay behind, and we have to hang on to something to get moving with the bus[⑥]. After the bus reaches a constant speed, we can free ourselves and our bodies move at that speed without any effort on our part. But when the bus slows down, our bodies want to continue travelling at the original velocity, and we must hang on to something again to keep from pitching forward. From this it is clear that our bodies tend to keep their state of motion and oppose any change in that condition. This is due to inertia too.

New Words and Expressions

mechanics [mi'kæniks] n. （复数；用作单或复数）力学
inertia [i'nəːʃiə] n. 惯性
conclude [kən'kluːd] vt. 断定，作结论
trick [trik] n. 特技，花招
rustle ['rʌsl] vi. （叶子）沙沙作响

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