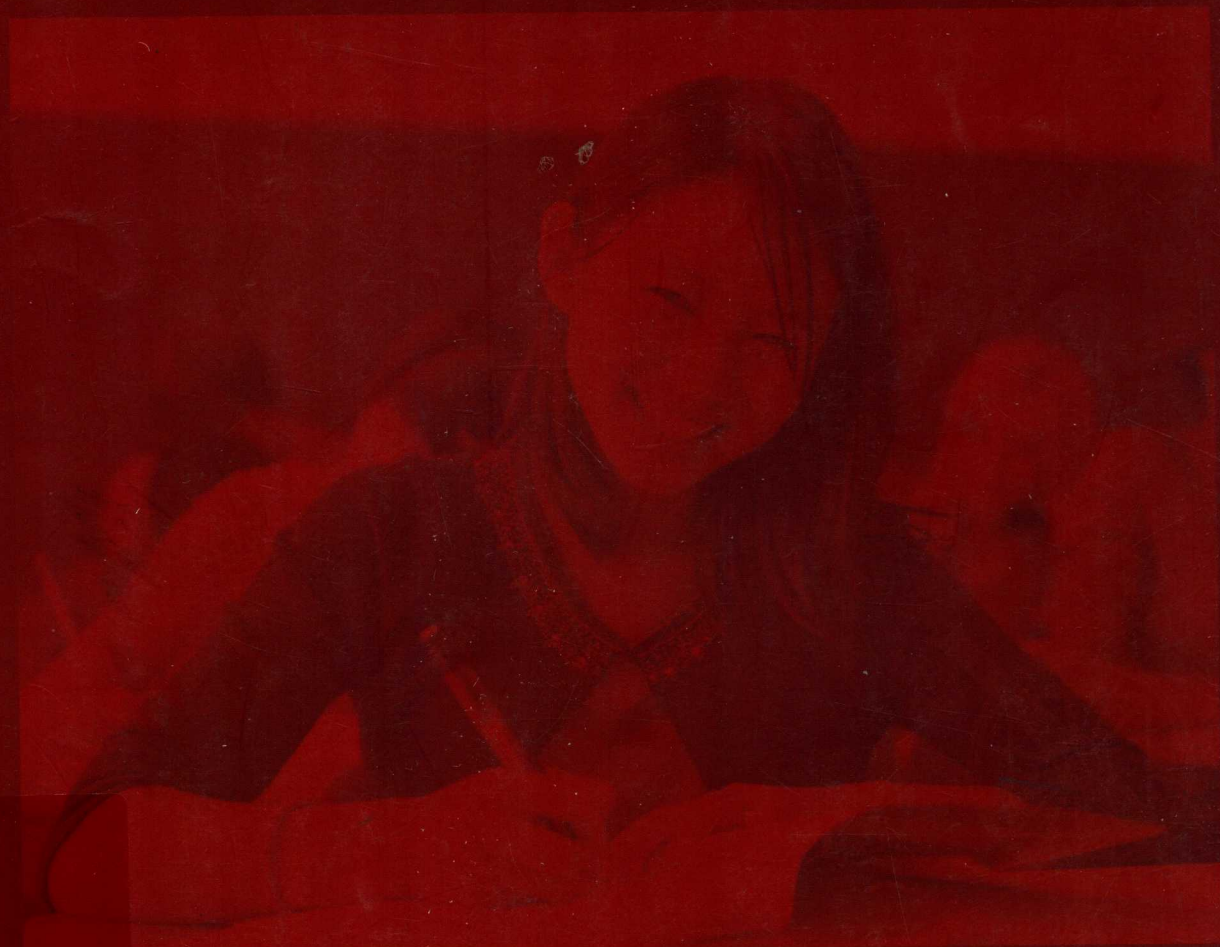


研究生院入学指导

新GRE数学教程

Quantitative Reasoning

强化篇/ 精讲冲刺篇



研究生院入学指导

新 GRE

数学教程

编写说明

自2011年8月考试改革ETS对GRE数学进行了一些调整。在老GRE中，数学每个section的题目数量为30个，其中前10道为比较大小题，后20道包括问题解决题（普通单选题）和图表题，时间一共为30分钟。而在新GRE考试中，每个section的题目数量改为20个，其中前8题是比较大小题，在考试中新增加了填空题和不定项选择题，时间调整为35分钟，同时引入了计算器。改革后，数学部分的整体难度有所增加，满分考生明显比以前减少，但数学核心的考点并没有变化，因此，中国考生依然在数学部分占有一定优势。

本教程分为强化篇和精讲冲刺篇两个部分。

强化部分选取的是一些有代表性的GRE数学题目，尽量不改变原题面貌。考生可以结合本书和官方指南上面的例题进行针对性的学习。强化篇的难度稍低于精讲冲刺篇，而且选取的图表题也比精讲冲刺篇少。

精讲冲刺篇则选取了真题中难度稍微偏大的题，并且加入了更大比例的图表题，更加接近现在新GRE考试的结构布局。学生在大量练习这些题的过程中查漏补缺，提高以英语为载体的数学考试的能力，争取在数学部分中取得高分。

尽管GRE数学对于中国考生来说是比较容易得高分的，但也不能掉以轻心。在完成本教程的过程中，希望各位能够及时发现错误和误区，为考试取得高分夯实基础。如果本教程能尽微薄之力，则编者甚慰。

编写组

2013年7月



新GRE数学教程

强化篇

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Section 1

A if the quantity in Column A is greater;

B if the quantity in Column B is greater;

C if the two quantities are equal;

D if the relationship cannot be determined from the information given.

Column A

Column B

1. The number of minutes
in 24 hours

The number of seconds
in 24 minutes

2. $1,300 \times 0.05$

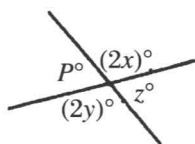
13×5

$$3x+5=20$$

$$5y+3=23$$

3. x

y



4. $p+x$

$y+z$

$$x < 0 < y$$

5. $x-y$

$y-x$

l_1 , l_2 and l_3 are three lines in space.

6. The number of points at
which lines l_1 and
 l_2 intersect

The number of points at
which lines l_2 and
 l_3 intersect

Yesterday the average (arithmetic mean) number of cars per hour that passed point P was 34 between 1:00 p.m. and 8:00 p.m. and was x between 2:00 p.m. and 7:00 p.m.

7. x

34

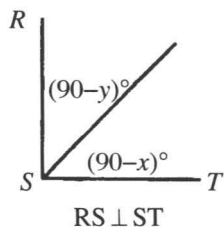
$$2 \leq y+3 \leq 6$$

8. y

-2

9. $\frac{1}{7} + \frac{1}{7}$

$\frac{1}{6} + \frac{1}{8}$



10. x

y

6 paneks = 10 regins
1 regin = 25 neugins
1 neugin = 25 endgins

11.

1 panek

1,025 endgins

$x+y=y$
 $xy>y$

12.

x

y

The radius and circumference of circle P are r and c respectively.

13.

$\frac{r}{c}$

$\frac{1}{3}$

Two successive discounts of 20 percent and 40 percent are equivalent to a single discount of x percent.

14.

x

52

A,B. and C are points on a line. The distance between A and B is twice the distance between A and C.
The distance between C and B is 10.

15.

The distance between
A and B

10

16.

5^2

2^5

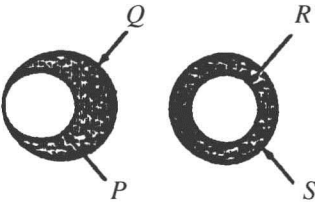


Figure1



Figure2

Circles P and R have the same radius and circles Q and S have the same radius.

17.

The area of the shaded
region in Figure 1

The area of the shaded
region in Figure 2

$a=2$ $b=4$

18.

$\frac{ab}{a+b}$

$\frac{a+b}{ab}$

19.

The number of
 $\frac{1}{4}$ -inch lengths in
a 4-inch length

1

$2(x-5)=10$

20.

x

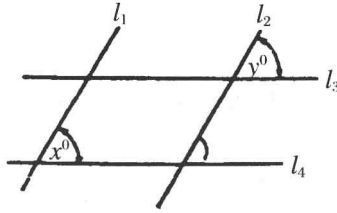
5

Brand X golf balls cost \$15 for 12 balls.
Brand Y golf balls cost \$9 for 6 balls.

21.

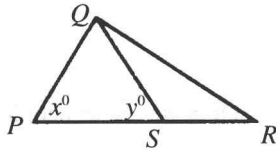
The average (arithmetic mean)
cost per ball for the 12
brand X balls

The average (arithmetic mean)
cost per ball for the 6
brand Y balls



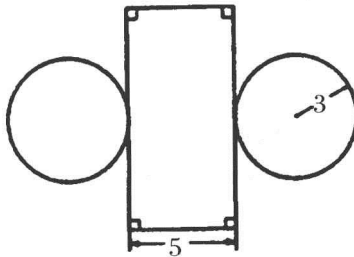
$l_1 // l_2$ and $l_3 // l_4$

22.	x	y
23.	$(\frac{3}{4})(\frac{4}{5})(\frac{5}{6})$	0.5
24.	b	d
$a > b, c > d, a > c$		
25.	The number of inches in the perimeter of a square region with side of s inches	The number of square inches in the area of a square region with side of s inches
For all real numbers x and y , $x \otimes y = x^2 - y^2$.		
26.	$14 \otimes 15$	$15 \otimes 14$



$x > y$

27.	$PQ + QR$	$QS + QR$
The average (arithmetic mean) of 9 numbers is 90. The average (arithmetic mean) of the first 5 of these numbers is 50.		
28.	The average (arithmetic mean) of the last 4 numbers	130



The figure above shows a cylindrical can that has been cut open and flattened.

29.	The volume of the can before it was cut open	45π
$x > 0$		
30.	\sqrt{x}	$\sqrt{x^2}$
Column A		Column B
31.	$\frac{2}{3}$	$\frac{7}{11}$

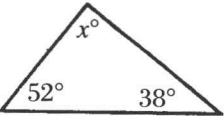
32. $32+(x+y)$ $x+(y+32)$

33. The circumference of circle S The diameter of circle S

The sale price of Mrs. Goodnick's house was \$73,000, 6 percent of which she paid to an agent as a commission.

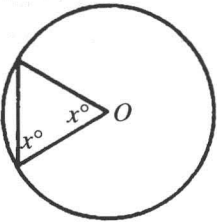
34. The agent's commission \$4,400

35. $5-x$ $x-5$



36. x 30

37. 10% of 60% of x 20% of 30% of x

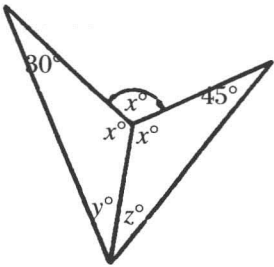


O is the center of the circle

38. x 60

Each person at a party shook hands exactly once with each of the other people at the party. There was a total of 21 handshakes exchanged at the party.

39. The number of people at the party 8



40. y z

41. The sum of the 3 greatest distinct integers that are less than 2 The sum of the 2 least distinct integers that are greater than -1

$|x|+2=5$

42. x -3

43. The area of a triangular region with perimeter of 50 The area of a rectangular region with perimeter of 50

$\frac{x}{y}=\frac{y}{z}=\frac{1}{3}$

44. $\frac{x}{z}$ $\frac{1}{3}$

A total of \$480 is in a certain cash register. All of the money is in one-dollar and five-dollar bills, and there are 30 more one-dollar bills than five-dollar bills.

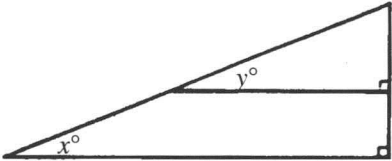
45. The sum of 30 and the number of
five-dollar bills in the cash register

Section 2

Column A	Column B
1. $\sqrt{389}$	20

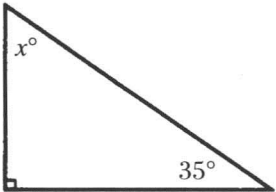
$$\frac{x^2}{3}=\frac{5}{6}$$

2. x	3
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3. x	y
--------	-----

4. $\frac{18}{18-15}$	$\frac{18}{18-12}$
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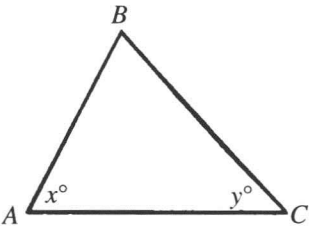


5. x	50
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$$m<0$$

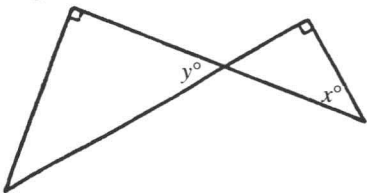
6. $3(m+15)$	$3m+45$
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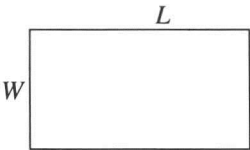
7. $200.01-0.009$	$200.1-0.09$
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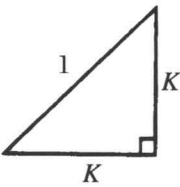


8. AC	AB
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9. The distance traveled by a sports car at a speed of 150 kilometers per hour	The distance traveled by a sports car at a speed of 160 kilometers per hour
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10.	x	y
A rope, 63 meters long, is cut crosswise into 3 pieces whose lengths are in the ratio 1 to 3 to 5.		
11.	The length of the longest piece	34 meters
12.	The number of integers between 15 and 51 that are squares of integers	The number of integers between 6 and 126 that are cubes of integers
13.	The maximum number of solid cubes having edges of length $\frac{1}{2}$ -meter that can be placed inside a cubical box having inside edges of length 1 meter	4
$x(x-2)=0$		
14.	x	1
m is an integer.		
15.	The remainder when m^3-m is divided by 2	1
16.	500×14	$1,000 \times 7$
$x=10$ and $y=5$		
17.	$(x-y)^2$	x^2-y^2
<div style="text-align: center;">  </div> <p>The perimeter of the rectangle above is 16.</p>		
18.	$W+L$	4
$x \neq 0$		
19.	$\frac{x+1}{x}$	$\frac{1}{x}$
A cord that is 20 meters long is cut into three sections.		
20.	The length of the longest section	The sum of the lengths of the two shorter sections
Segments RS and MN intersect at point T and are diameters of the same circle.		
21.	The area of $\triangle RTM$	The area of $\triangle STN$
$x > y$		
22.	$x-y$	0
23.	The remainder when 43 is divided by 5	The remainder when 52 is divided by 7
Cube C has volume 8 cubic centimeters.		
24.	The area of one of the faces of cube C	3 square centimeters
25.	The number of prime numbers greater than 40 and less than 50	The number of prime numbers greater than 10 and less than 20



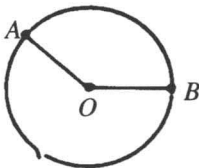
26.	K^2	1
27.	$2(-x)$	$3x$

$m \neq 2$

28.	$\frac{3}{m-2}-1$	$\frac{m-5}{2-m}$
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Ms. Smith got an 8 percent cost-of-living raise of \$20 per week.

29.	Ms. Smith's new weekly salary	\$260
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The circle has center O .

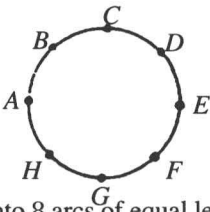
30.	Length of minor arc AB	$AO+BO$
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31.	$1-\frac{2}{3}$	$1-\frac{3}{4}$
-----	-----------------	-----------------

$3^x=3$

$4^y=4$

32.	x	y
-----	-----	-----



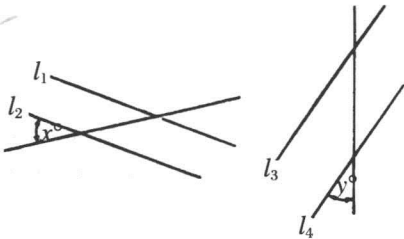
The circle above is divided into 8 arcs of equal length.

33.	Length of a line segment from A to D	Length of a line segment from B to E
-----	--------------------------------------	--------------------------------------

A total of 400 tickets to a concert were sold, some at \$10 each and some at \$5 each.

34.	The total receipts from the 400 tickets sold	\$3,000
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35.	$\sqrt{80}+x$	$9+x$
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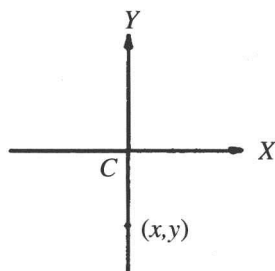
$$l_1/l_2$$

$$l_3/l_4$$

36. x y

$$y=x+2$$

37. $y-1$ $x+1$



Note : Drawn to scale.

38. x y

39. $\frac{1}{9}\%$ 0.11

40. The difference between 2 numbers, each of which is between 3 and 4 The sum of 2 numbers, each of which is between 1 and 2

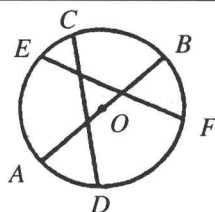
41. $(x+x)^2$ $x^2+2x^2+x^2$

42. The length of the diagonal of a rectangle with perimeter 20 The length of the diagonal of a rectangle with perimeter 24

$$2r=3t$$

$$t \neq 0$$

43. $\frac{r}{t}$ $r+t$

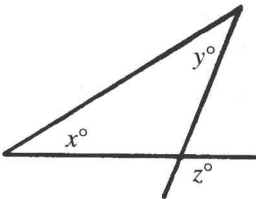


44. Circumference of the circle with center O Sum of the lengths of chords AB , CD , and EF

Mr. Smith traveled a distance of 100 kilometers, half the distance at 40 kilometers per hour and the other half at 80 kilometers per hour.

45. Mr. Smith's average speed for the 100 kilometers traveled 60 kilometers per hour

Section 3

Column A	Column B
1. 1^2+3	$\frac{4}{7}\times7$
2. $100.010-0.009$	$100.000+0.002$
x equals 25 percent of 12. y equals 10 percent of 40.	
3. $\frac{x}{y}$	$\frac{y}{x}$
4. $\left(\frac{1}{2}\right)^{15}$	$\left(-\frac{1}{2}\right)^{15}$
When x is divided by 25, the remainder is 0.	
5. The remainder when x is divided by 5	0
Tractor-trailer T has 5 axles, on one of which there are only 2 wheels. On each of the other axles, there are 4 wheels. T has no spare wheels and no spare axles.	
6. The number of wheels T has	3 times the number of axles T has
7. $\frac{1}{2}+\frac{1}{3}$	$\frac{2}{5}$
8. p	q
9. The number of walking steps, each of length 0.4 meter, needed to walk completely along the perimeter of a square rug with side of length 8 meters	The number of walking steps, each of length of 0.5 meter needed to walk completely along the perimeter of a rectangular rug with length of 11 meters and width of 8 meters
The average (arithmetic mean) of 2 positive integers is equal to 31 and each of the integers is greater than 26.	
10. The greater of the 2 integers	36
	
11. $x+y$	z
For all real numbers p and r , $p\Diamond r=pr-p+r$.	
12. $(-4)\Diamond5$	$5\Diamond(-4)$
13. The sum of 2 and the number of edges of a cube	The sum of the number of vertices of a cube and the number of faces of a cube

$$n < 0, q > 0, \text{ and } r > 0$$

$$14. \quad (2n)(2q)(2r) \qquad 2[(n)(q)(r)]$$

P and Q are points on a number line. The coordinate of P is 5 and the distance between P and Q is 12.

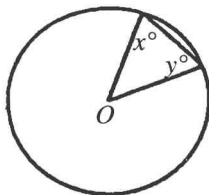
$$15. \quad \text{The coordinate of Q} \qquad 16$$

$$16. \quad \text{The number of hundreds in 834} \qquad \text{The number of thousands in 7,234}$$

$$0.7 + 0.3 + 0.8 + x = 3$$

$$17. \quad x \qquad 1.1$$

$$18. \quad \frac{7+8+9+10}{4} \qquad \frac{8+9+10}{3}$$



O is the center of the circle above.

$$19. \quad x \qquad y$$

Jane is taller than Peter and Peter is shorter than Karen.

$$20. \quad \text{Jane's height} \qquad \text{Karen's height}$$

$$x^5 = -32$$

$$21. \quad x \qquad -1$$

$$22. \quad \begin{array}{l} \text{The length of a diagonal of} \\ \text{a square with area 16} \end{array} \qquad \begin{array}{l} \text{The length of a diagonal of} \\ \text{a square with perimeter 16} \end{array}$$

$$23. \quad 3\left(\frac{r}{3} + \frac{s}{4} + \frac{5}{3}\right) \qquad r - s + 5$$

$$24. \quad \sqrt{\frac{1}{9}} + \sqrt{\frac{1}{9}} + \sqrt{\frac{1}{9}} + \sqrt{\frac{1}{9}} \qquad \sqrt{\frac{4}{9}}$$

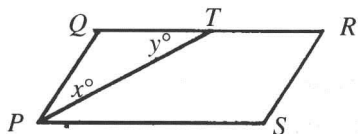
Point P has coordinates $(-1, 1)$.

point Q has coordinates $(0, 1)$.

$$25. \quad \text{The distance from P to the origin} \qquad \text{The distance from Q to the origin}$$

$$26. \quad x^2 + y \qquad x^2 - y$$

$$27. \quad \begin{array}{l} \text{The least positive integer that is} \\ \text{divisible by both 14 and 21} \end{array} \qquad \begin{array}{l} \text{The least positive integer that is} \\ \text{divisible by both 14 and 28} \end{array}$$



PQRS is a parallelogram and $PQ = RT$.

$$28. \quad x \qquad y$$

Mrs. Jones sold two houses for \$80,000 each. One house was sold at a 20 percent loss and the other at a 20 percent gain.

$$29. \quad \text{The gain minus the loss} \qquad 0$$