Question 1 Test 2, First QR Section
In a decimal number, a bar over one or more consecutive digits....
QA: $0.\overline{717}$ QB: $0.\overline{71}$
Arithmetic: Decimals Answer: *Quantity A is greater*

1. Consider the two quantities:

   Quantity A: $0.\overline{717} \rightarrow 0.717717\ldots$
   Quantity B: $0.\overline{71} \rightarrow 0.717171\ldots$

   Look at the first four numbers after the decimal. The first three numbers after the decimal are the same, but the fourth number after the decimal (ten thousandths place) is different.

   Quantity A: 0.7177
   Quantity B: 0.7171

2. Quantity A is greater.

Question 2 Test 2, First QR Section
Of 30 theater tickets sold, 20 tickets were sold....
QA: Average of the prices of the 30 tickets QB: $50
Statistics: Averages Answer: *Quantity B is greater*

1. Although the prices of the tickets vary, we can still find out what the average would be if all of the tickets were as expensive as possible. The first 30 tickets vary between $10 and $30, so let's make them all be $30 tickets:

   $\$30 \times 20 = \$600$

   The same goes for the 10 tickets that are between $40 and $60. Make them all equal $60:

   $\$60 \times 10 = \$600$

   The total price of these 30 tickets:

   $\$600 + \$600 = \$1200$

2. Now find the average price of these 30 tickets:

   $$\frac{\text{sum}}{\text{\# of \#s}} = \text{average} \rightarrow \frac{\$1200}{30} \rightarrow \$40$$

3. Even when the tickets are at their maximum price, Quantity B is still greater.

Question 3 Test 2, First QR Section
x > 1

QA: $\frac{x}{x+1}$ **QB:** $\frac{-x}{1-x}$

Arithmetic: Fractions and Number Properties Answer: *Quantity B is greater*

1. SUPPLY a number for x. Say $x = 2$

$$\text{Quantity A} = \frac{x}{x+1} \rightarrow \frac{2}{2+1} \rightarrow \frac{2}{3}$$

$$\text{Quantity B} = \frac{-x}{1-x} \rightarrow \frac{-2}{1-2} \rightarrow \frac{-2}{-1} \rightarrow 2$$

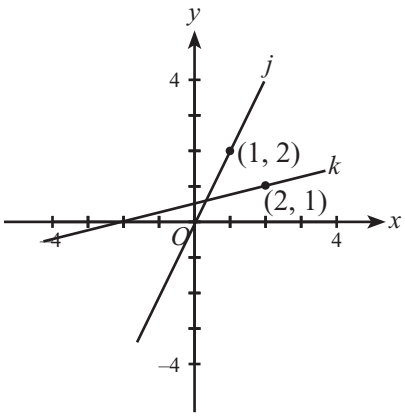
2. Quantity B will always be greater, no matter how great the supplied number, because Quantity A will always create a positive proper fraction (less than 1) while Quantity B will create a positive improper fraction (greater than 1). Imagine if $x = 100$:

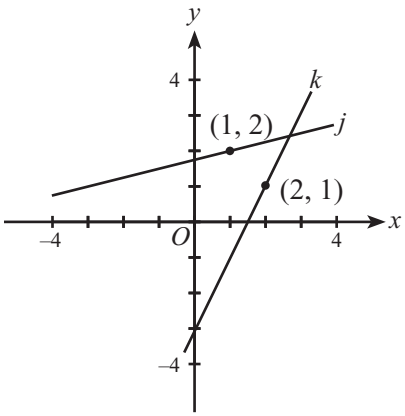
$$\text{Quantity A} = \frac{x}{x+1} \rightarrow \frac{100}{100+1} \rightarrow \frac{100}{101}$$

$$\text{Quantity B} = \frac{-x}{1-x} \rightarrow \frac{-100}{1-100} \rightarrow \frac{-100}{-99} \rightarrow \frac{100}{99}$$

Question 4 Test 2, First QR Section
In the *xy*-plane, the point (1, 2) is on line *j*....
QA: Slope of line *j* QB: Slope of line *k*
Coordinate Geometry: Slope of a Line Answer: *The relationship cannot be determined*

1. Positive slope goes up from left to right. Imagine lines j and k, where j is has a steeper (and thus greater) slope than line k. But notice that the opposite can be true, too:





2. It is impossible to determine without more information about these two lines.

Question 5 Test 2, First QR Section
For each positive integer *n*, the *n*th term....
QA: Sum of the first 39 terms QB: 39
Statistics: Sequences Answer: *Quantity B is greater*

1. Start by determining the first few terms to see if there is a pattern, as there often is in sequence questions:

1st term: n = 1	$1 + (-1)^n$	→	$1 + (-1)^1$	→	$1 + -1$	→	0
2nd term: n = 2	$1 + (-1)^n$	→	$1 + (-1)^2$	→	$1 + 1$	→	2
3rd term: n = 3	$1 + (-1)^n$	→	$1 + (-1)^3$	→	$1 + -1$	→	0
4th term: n = 4	$1 + (-1)^n$	→	$1 + (-1)^4$	→	$1 + 1$	→	2

As you can see, all odd terms result in 0, while all even terms result in 2. So only the even terms will count in the sum:

1st		2nd		3rd		4th		5th		6th		7th	
0	+	2	+	0	+	2	+	0	+	2	+	0	+ ...

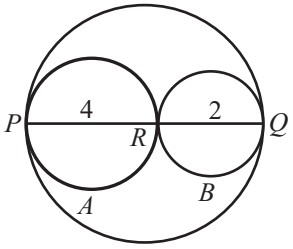
How many even numbers from 1 to 39? 19

$19 \times 2 = 38$

Quantity B is greater.

Question 6 Test 2, First QR Section
Three circles with their centers on line segment PQ ....
QA: Circumference of the largest QB: Sum of the circumferences of the two smaller
Geometry: Circles Answer: *The two quantities are equal*

1. We have labeled the small circles as *A* and *B* to help with this discussion. SUPPLY numbers for the lengths of *PR* and *RQ*. If *PR* is 4, then the radius of circle A is 2; if *RQ* is 2, then the radius of circle B is 1. Thus, if *PQ* is 6, the radius of the largest circle is 3. Now find the circumference of each circle:



The circumference of A = $2\pi r \rightarrow 2\pi 2 \rightarrow 4\pi$
The circumference of B = $2\pi r \rightarrow 2\pi 1 \rightarrow 2\pi$
The sum of the circumferences of the two smaller circles = 6π

The circumference of the largest circle = $2\pi r \rightarrow 2\pi 3 \rightarrow 6\pi$

The two quantities are equal.

The figures on the GRE Quantitative Reasoning section are not necessarily drawn to scale. Since no measurements are provided for these circles, we cannot assume that circle *A* is larger than circle *B*, just because it looks that way. No matter what numbers we supply, the relationship between the circumference of the largest circle and the sum of the circumferences of circle *A* and circle *B* is the same.

Question 7 Test 2, First QR Section
***n* is a....**
QA: Remainder when *n* is divided by 5 **QB: Remainder when *n* + 10 is divided by 5**
Arithmetic: Remainders Answer: *The two quantities are equal*

1. Some students may realize immediately that the two quantities are equal because 10 is a multiple of 5, thus it will not affect the remainder when added to *n*. But if you do not see this, SUPPLY numbers for *n*:

   $n = 6$ and $n + 10 = 16$

   Quantity A: 1 R 1, $5\overline{)6}$, -5, 1

   Quantity B: 3 R 1, $5\overline{)16}$, -15, 1

   $n = 7$ and $n + 10 = 17$

   Quantity A: 1 R 2, $5\overline{)7}$, -5, 2

   Quantity B: 3 R 2, $5\overline{)17}$, -15, 2

2. The two quantities are equal.

Question 8 Test 2, First QR Section
***k* is an integer....**
QA: *k* **QB: –2**
Algebra: Inequalities and Exponents Answer: *Quantity B is greater*

1. The denominator of the first fraction ($\frac{1}{2^{1-k}}$) must be greater than 8 in order for the first fraction to be less than one-eighth.

   Thus, $2^{1-k} > 8$.

2. In order for 2^{1-k} to be greater than 8, the exponent must be greater than 3, because $2^3 = 8$.

   Thus, $1 - k > 3$

3. Solve for *k*:

   $1 - k > 3$
   $-k > 2$
   $k < -2$ (Remember to flip the sign!)

   k must be less than –2, thus Quantity B is greater.

Question 9 Test 2, First QR Section
At Company Y, the ratio of the number of female employees....
Arithmetic: Ratios Answer: *100*

1. Set the ratios up as fractions, and then cross multiply the proportion:

$$\begin{array}{r}\text{Women:}\\ \text{Men:}\end{array}\ \frac{3}{2}=\frac{150}{?} \quad\rightarrow\quad \frac{3}{2}\times\frac{150}{?} \quad\rightarrow\quad (3)(?) = (2)(150) \quad\rightarrow\quad (3)(?) = 300 \quad\rightarrow\quad ? = 100$$

Question 10 Test 2, First QR Section
If $\frac{a-b}{a+b} = 2$ and...?

Algebra: Equations Answer: *–3*

1. Plug $b = 1$ into the equation, and then solve for a:

$$\frac{a-b}{a+b} = 2 \quad\rightarrow\quad \frac{a-1}{a+1} = 2 \quad\rightarrow\quad a - 1 = 2(a + 1) \quad\rightarrow\quad a - 1 = 2a + 2 \quad\rightarrow$$
$$a = 2a + 3 \quad\rightarrow\quad -a = 3 \quad\rightarrow\quad a = -3$$

Question 11 Test 2, First QR Section
A quality control analyst collected 200 measurements....
Arithmetic: Range Answers: *33.0, 34.0*

1. The range is the difference between the highest and lowest points. If 49.5 is the lowest point, then you can calculate the highest point using 17 as the range:

   49.5 + 17 = 66.5

   But if 49.5 is the highest point, then the lowest point will be 17 centimeters less:

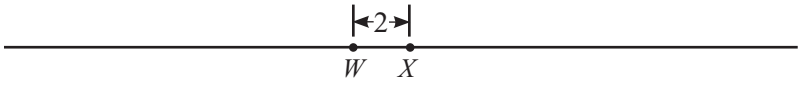
   49.5 – 17 = 32.5

2. Choices 31.0 and 32.0 are impossible because they fall out of the range when 49.5 is the highest point. But choices 33.0 and 34.0 are within that range.

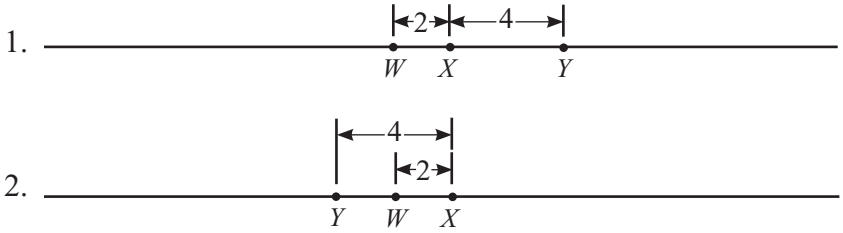
Question 12 Test 2, First QR Section
Points *W*, *X*, *Y* , and *Z* are on a line....
Arithmetic: Number Lines Answer: *5*

1. DIAGRAM the question.

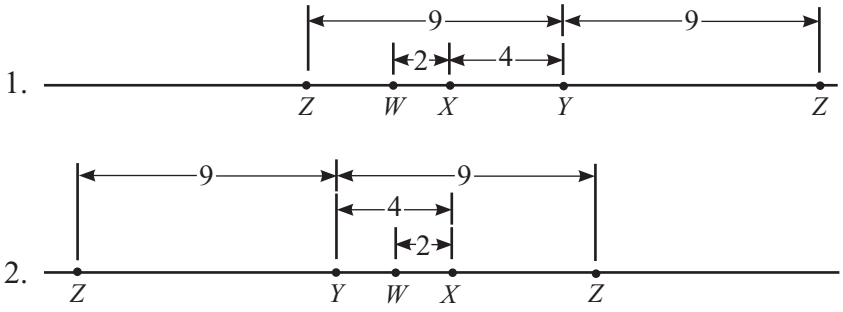
   The distance between W and X is 2:



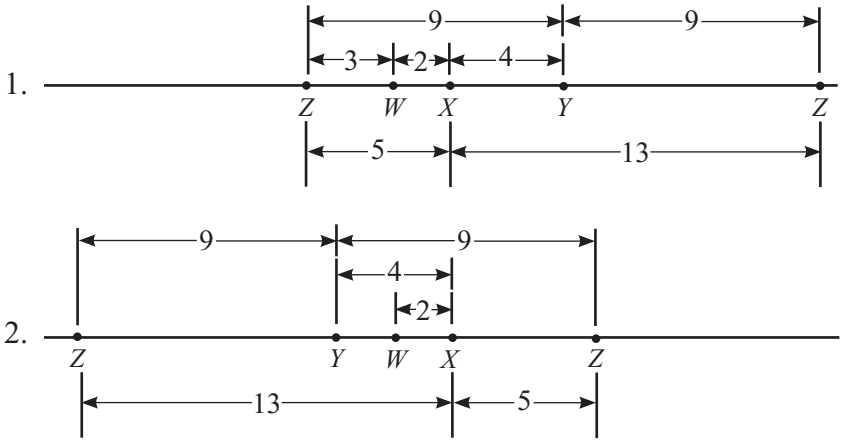
   The distance between X and Y is 4. This means that *Y* could be in two locations on the line. While you can diagram both points on the same number line, it may be easier to visualize on two separate diagrams:



   The distance between Y and Z is 9. Again, *Z* can be in two locations on both number lines. In order to avoid having four diagrams, find *Z* twice on each number line:

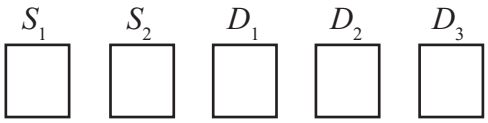


2. The possible distances between *X* and *Z* are 5 and 13 on both possible number lines.

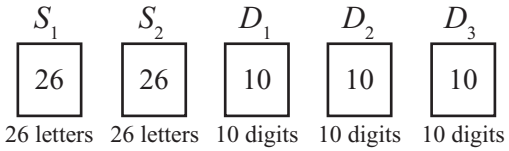


Question 13 Test 2, First QR Section
A certain identification code is a list of five symbols: S_1,S_2,D_1....
Counting Problems: Combinations Answer: *676,000*

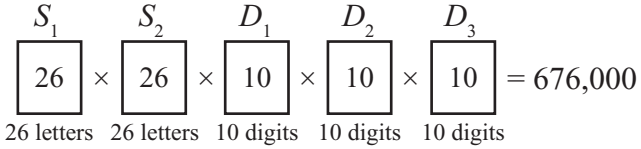
1. DIAGRAM the question. First, set up your "cards" using each of the elements in the code:



Now enter the number of possibilities for each element. The letters and numbers are allowed to repeat, so there will be the same number of possibilities for S_1 as there are for S_2. Similarly, there will be the same number of possibilities for D_1, D_2, and D_3.



2. To find the total number of combinations, multiply the possibilities:



Question 14 Test 2, First QR Section
MEDIAN HOME PRICES TABLES
In 1986, for which of the cities listed...?
Data Analysis Answer: *Boston*

1. To calculate the answer, use the second table, “Median Home Prices and Related Data for Selected Northeastern Cities, 1986.”

2. Notice that we only need to check five cities—the five listed as answer choices (New York, Boston, Newark, Danbury, Pittsburgh). To calculate the other three would be a waste of time.

3. Most students should be able to estimate the difference between the home price and the down payment to see that Boston is the greatest difference, but you can also calculate them:

New York: 129,700 – 42,250 = 87,450
Boston: 126,00 – 30,000 = 96,000 ✓
Newark: 116,000 – 29,450 = 86,550
Danbury: 95,950 – 19,750 = 76,200
Pittsburgh: 54,150 – 11,500 = 42,650

Question 15 Test 2, First QR Section
MEDIAN HOME PRICES TABLES
In 1986 the median home price in Danbury was approximately...?

Data Analysis Answer: $1\frac{1}{2}$

1. To calculate the answer, use the second table, "Median Home Prices and Related Data for Selected Northeastern Cities, 1986."

2. TRANSLATE using the information from the second table. Because the question is asking for an approximate value, we can round the prices of the homes:

The price in Danbury was how many times the price in Trenton?

$96,000 = ? × $66,000

96,000 = 66,000(?)
1.45 = ?

The price in Danbury was approximately 1.5 times the price in Trenton.

Question 16 Test 2, First QR Section
MEDIAN HOME PRICES TABLES
In 1986 in Newark, what was the approximate ratio...?
Data Analysis: Ratios Answer: *1/4*

1. To calculate the answer, use the second table, "Median Home Prices and Related Data for Selected Northeastern Cities, 1986."

2. The monthly housing cost in Newark was $1,139. Find the annual housing cost:

$1,139 × 12 = $13,668

2. The homebuyer's annual income in Newark was $54,660.

Thus, the ratio is 13,668 : 54,660 or $\frac{13,668}{54,660}$ or 0.25. The approximate answer is 1/4.

Question 17 Test 2, First QR Section
Which of the following is equal to 6^{14}... ?

Algebra: Exponents Answer: $(2^9)(3^7)$

1. The numerator, 6^{14}, can be factored, and then the properties of exponents can be applied:

$$\frac{6^{14}}{(2^5)(3^7)} \rightarrow \frac{(2^{14})(3^{14})}{(2^5)(3^7)} \rightarrow \frac{(2^{14})}{(2^5)} \times \frac{(3^{14})}{(3^7)} \rightarrow (2^{14-5}) \times (3^{14-7}) \rightarrow (2^9) \times (3^7)$$

Question 18 Test 2, First QR Section
A certain train is traveling at a constant rate....

Arithmetic: Rates Answer: $\frac{ty}{s}$

1. Set up a proportion and cross multiply:

$$\begin{array}{r} \text{Distance:} \\ \text{Miles:} \end{array} \frac{s \text{ miles}}{t \text{ hours}} = \frac{y \text{ miles}}{? \text{ hours}} \rightarrow \frac{s \text{ miles}}{t \text{ hours}} \times \frac{y \text{ miles}}{? \text{ hours}} \rightarrow (s)(?) = ty \rightarrow ? = \frac{ty}{s}$$

Question 19 Test 2, First QR Section
A certain experiment has three possible outcomes....

Probability and Fractions Answer: *4/7*

1. The outcomes are mutually exclusive, meaning that they cannot happen at the same time. So the three outcomes are separate.

2. Because there are only three outcomes, we know that one of these outcomes will definitely happen. Thus, the probability of the three outcomes must add up to 1 (representing 100% certainty):

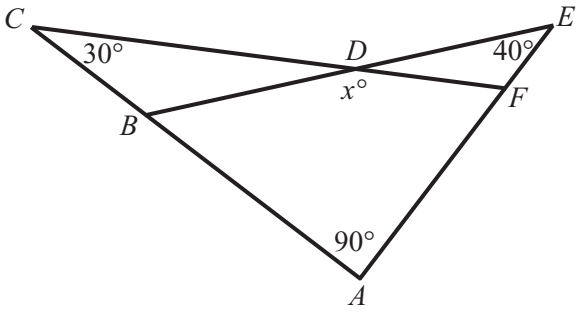
$$p + \frac{p}{2} + \frac{p}{4} = 1$$

Find a common denominator for the left side of the equation:

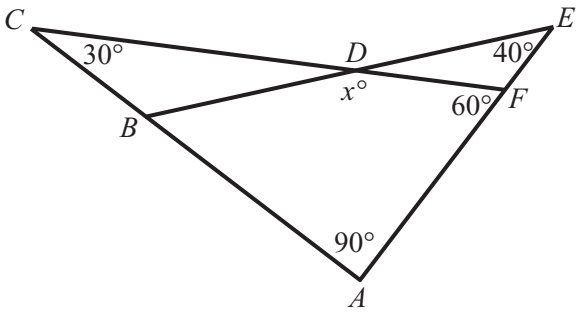
$$p + \frac{p}{2} + \frac{p}{4} = 1 \rightarrow \frac{8p}{8} + \frac{4p}{8} + \frac{2p}{8} = 1 \rightarrow \frac{14p}{8} = 1 \rightarrow 14p = 8 \rightarrow p = \frac{8}{14} \rightarrow p = \frac{4}{7}$$

Question 20 Test 2, First QR Section
In the figure shown, what is...?
Geometry: Triangles Answer: *160*

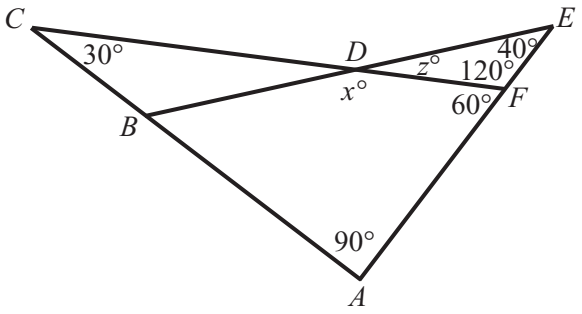
1. To help with discussion, we have labeled points on the figure.



2. Start with triangle *ACF*. Angle *A* is 90° and angle *C* is 30°, so angle *AFC* must be 60° (180° – 90° – 30° = 60°).



3. If *AFC* is 60°, then *EFD* must be 120° (180° – 60° = 120°).



4. Now you can find angle *FDE*, which we have called angle *z*: (180° – 120° – 40° = 20°). If *z* = 20°, then *x* = 160°, because *x* + *z* = 180°.