

THE MEDIAN

To find the median, put the numbers in consecutive order. The middle number is the median. If there is an even number of numbers in the group, the median is the average of the two middle numbers.

Like the median in a road, the median is the thing in the *middle*.

Find the median of each of the following sets of numbers:

- 1) 2, 8, 11, 5, 4 Median _____
 2) 3, 7, 6, 5 Median _____

THE MODE

The *mode* is the number that appears the greatest number of times in a list of numbers. For example, 3 is the mode of 2, 3, 3, 5, 6, 8, 15.

Mode sounds like *most*—the number that appears the *most* in the list.

Find the mode of each of the following lists of numbers:

- 1) 3, 4, 6, 8, 8, 9 Mode _____
 2) -4, -8, 4, 2, 9, 5, 3, 5 Mode _____

20, 30, 50, 70, 80, 80, 90

8. Seven students played a game and their scores from least to greatest are given above. Which of the following is true of the scores?
- I. The average (arithmetic mean) is greater than 70.
 - II. The median is greater than 70.
 - III. The mode is greater than 70.
- (A) None
 (B) III only
 (C) I and II only
 (D) II and III only
 (E) I, II, and III

$$P = \{4, 7, 11, 13, n\}$$

16. For which of the following values of n would the median of set P be equal to the average (arithmetic mean)?
- (A) 7
 - (B) 11
 - (C) 13
 - (D) 14
 - (E) 20

25. If y is a positive integer, and the median of $3y$, y , $5y$, $2y$, and $4y$ is 27, what is the value of y ?

	7	7	
•	•	•	•
	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

PERCENTS

Percents are also fractions. (Percent means "out of 100.") For example:

$$20\% = \frac{20}{100} = \frac{1}{5} \quad 250\% = \frac{250}{100} = \frac{25}{10} = \frac{5}{2} \quad 0.5\% = \frac{0.5}{100}$$

Translate percent problems into fraction problems.

English	Math Equivalent
% (percent)	
of	
what	
is, are, were, did, does	

- 1) 40 percent of 35 is equal to 25 percent of what number?

- 2) What percent of 5 is 6?

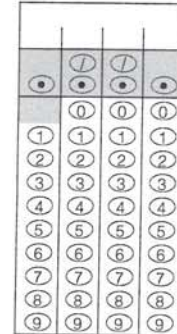
- 3) If 30 percent of 200 is the same as 400 percent of x , then $x = ?$

Try these:

16. At Joe's Farm there are 20 cows, 17 pigs, and 13 horses. What percent of the animals on the farm are not pigs?

- (A) 13%
- (B) 20%
- (C) 33%
- (D) 34%
- (E) 66%

21. On a two-part exam, a student answered 40 questions in the first part correctly and 60 percent of the questions in the second part correctly. If the student answered a total of 70 questions correctly, how many questions were there in the second part of the exam?



15. In a bag of lollipops, 35 percent of the lollipops are lemon, 15 percent are cherry, 20 percent are grape, 5 percent are watermelon, and the other 15 lollipops are orange. How many lollipops are in the bag?

- (A) 24
- (B) 30
- (C) 36
- (D) 45
- (E) 60

PERCENT INCREASE/DECREASE

$$\% \text{ Increase / Decrease} = \frac{\text{Difference}}{\text{Original}} \cdot 100$$

14. A dress that originally sold for \$120 is now being sold for \$96. By what percent was the original price of the dress discounted?

- (A) 8%
 (B) 12%
 (C) 20%
 (D) 24%
 (E) $33\frac{1}{3}\%$

21. After a sale at the local department store, the total number of television sets in private homes in Greene County rose from 17,800 to 24,000. By approximately what percent did the total number of television sets increase?

- (A) 16%
 (B) 35%
 (C) 50%
 (D) 65%
 (E) 75%

If it's a percent increase problem, the original is the *smaller* number.

If it's a percent decrease problem, the original is the *bigger* number.

Column A

Column B

12.

Percent increase
from 3 to 4

Percent decrease
from 4 to 3

PROPORTIONS

A car travels at a rate of 50 miles per hour.

How long will it take the car to travel 300 miles? _____

Set up an equation with two fractions like this:

$$\begin{array}{ccc} \text{The one you know} & & \text{The one you want to know} \\ \frac{50 \text{ (miles)}}{1 \text{ (hour)}} & = & \frac{300 \text{ (miles)}}{x \text{ (hours)}} \end{array}$$

Put the same thing on the top of both fractions, and the same thing on the bottom.

After you set up the fractions properly, use your calculator to solve the problem.

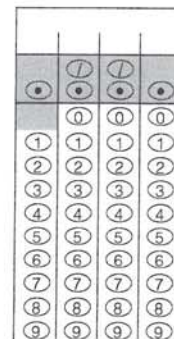
There are 32 ounces in 1 quart.

128 ounces equal how many quarts? _____

How many ounces are there in 7 quarts? _____

Some ratio questions are really about proportions.

18. If the ratio of 27 to 0.3 is equal to the ratio of 18 to y , what is the value of y ?



Try these:

4. On a certain map, Washington, D.C. and Boston are 4 inches apart. If Washington, D.C. and Boston are actually 500 miles apart, and if the map is drawn to scale, then 1 inch represents how many miles on the map?
- (A) 125
(B) 150
(C) 250
(D) 375
(E) 500
7. If 100 paper clips cost \$2, what is the cost, in cents, of 3 paper clips?
- (A) 2
(B) 3
(C) 6
(D) $16\frac{2}{3}$
(E) $33\frac{1}{3}$
17. In 1976, Elvis consumed three times his body weight in peanut butter and banana sandwiches. If Elvis's body weight in 1976 was 250 pounds, and if a peanut butter and banana sandwich weighs four ounces, then how many such sandwiches did Elvis consume during 1976? (1 pound = 16 ounces)
- (A) 750
(B) 1,000
(C) 1,500
(D) 3,000
(E) 4,000

PROBABILITIES

On the SAT, probability is expressed as a fraction.

11. A complete cycle of a traffic light takes 80 seconds. During each cycle, the light is green for 40 seconds, amber for 10 seconds, and red for 30 seconds. When a randomly chosen car arrives at the traffic light, what is the probability that the light will not be red?
- (A) $\frac{7}{8}$
(B) $\frac{5}{8}$
(C) $\frac{4}{8}$
(D) $\frac{3}{8}$
(E) $\frac{1}{8}$

Column A

Column B

From a set of 36 cards numbered from 1 to 36, a single card is to be drawn at random.

10.

The probability that the number on the card will be a multiple of 3

The probability that the number on the card will be a multiple of 5

Suppose you have a six-sided die, and the sides are numbered 1 through 6. If you rolled the die, what is the probability that the number rolled will be less than 7?

100% probability is expressed as 1.

Now try this example:

16. Joseph drops a rectangular box, denting two adjacent sides. If he places the box on a table so that one of the dented sides is on the bottom, what is the probability that the other dented side is NOT on top?

- (A) $\frac{1}{6}$
(B) $\frac{1}{3}$
(C) $\frac{1}{2}$
(D) $\frac{2}{3}$
(E) 1

SUMMARY

Draw the average pie and label its parts.

2, 2, 4, 6, 8

What's the average of the numbers above? _____

Median? _____

Mode? _____

How do you calculate percent increase or decrease?

What does a ratio box look like and what is it for?

A question that says "ratio" could also be about _____ .