

## Kaplan p.35

Whole Number	Real Number	Prime Number
Fraction	Even Number	Odd Number
Negative Number	Positive Number	Integer

Describe each number in as many ways as possible.  
(Drag the classifier to the number)

<p><b>354:</b></p> <ul style="list-style-type: none"> <li>Even Number</li> <li>Positive Number</li> <li>Integer</li> <li>Whole Number</li> <li>Real Number</li> </ul>	<p><b>41:</b></p> <ul style="list-style-type: none"> <li>Prime Number</li> <li>Odd Number</li> <li>Whole Number</li> <li>Positive Number    Integer</li> <li>Real Number</li> </ul>
<p><b>3/4:</b></p> <ul style="list-style-type: none"> <li>Fraction</li> <li>Positive Number</li> <li>Real Number</li> <li><del>Integer</del></li> </ul>	<p><b>-6:</b></p> <ul style="list-style-type: none"> <li>Even Number</li> <li>Real Number    Negative Number</li> <li>Integer</li> </ul>

Category	Quick Check	Example	Non-Example
Whole Number	if a number can be written without a decimal or a fraction, and it isn't negative, it is a whole number	1, 2, 7 482	1.2, 2.5 $\frac{1}{2}$ , $-\pi$ -2
Integer	if a number can be written without a decimal or a fraction, it is an integer	41, 30 5, 69 0, -96	$\frac{1}{10}$ , $-\frac{1}{20}$ $\pi$ , 3.8
Even	if an integer ends in 0, 2, 4, 6, or 8, it is even	2, 10, 200 250	0, 1, 3, 2, 1 11, ... $\frac{9}{5}$
Odd	if an integer ends in 1, 3, 5, 7, or 9, it is odd	3, 5, 1, 1	2, 2.1 $\frac{3}{5}$ , 0
Factor	if a number divides another number without a remainder, it is a factor. Factors are in reference to a specific number and will always be smaller than that number	2, 6, 3, 4 1, 12	0, 5, 7, 8, 112, 13, 24 53, 201
Multiple	if you can divide the number evenly it is a multiple. Multiples are in reference to a specific number and will always be equal or greater than that number	12, 24, 36, 48 60, 72 144, -24	23, 25 $\frac{1}{3}$ -2
Prime	only divisible by itself and one, never even.	41, 7, 5 13, 17, 2	16, 12, 69 .9, 21

## Picking Numbers: a solving strategy

### When should you pick numbers?

You should pick numbers when the problem includes variables. or unknown values

### How do you use this strategy?

- Pick a number to stand for the unknown value(s) in the problem.
- Solve the problem using the number(s) you picked and find the answer choice that satisfies the conditions. If there are variables in the answer choice, substitute the number(s) you picked in the answer choices and simplify
- **Repeat this strategy with different numbers** to see if other answer choices are possible. Eliminate answer choices that do not yield the correct answer.

1. The sum of two consecutive integers is **never** divisible by

(A) 2  
 (B) 3  
 (C) 5  
 (D) 7  
 (E) 11

A

what does "consecutive integers" mean?

3, 4      -2, -3  
 4, 5

let's pick some numbers:

choices	sum	divisible by
4 and 5	9	3
7 and 8	15	3, 5
10 and 11	21	3, 7

what do these sums have in common?

all odd

all multiples of 3

Is that true for all sums of consecutive integers? Why?

$12 + 13 = 25$  not a multiple of 3

one is always even,  
 one is always odd so  
 sum is always odd.

## Consecutive Numbers

Consecutive Even Integers:

$$2, 4 \quad 6, 8 \quad -4, -2$$

$$x, x+2, x+4, x+6, \dots$$

*x is even*

Consecutive Odd Integers:

$$1, 3 \quad 5, 7 \quad 8461, 8463$$

$$-1, 1$$

$$x, x+2, x+4, x+6, \dots$$

*x is odd*

Consecutive Integers:

$$x, x+1, x+2, x+3, \dots$$

2. If  $-1 < g < 0$ , which of the following gives the correct ordering of  $|g|$ ,  $g$ , and  $g^2$ ?

- (A)  $g < g^2 < |g|$
- (B)  $|g| < g^2 < g$
- (C)  $g^2 < |g| < g$
- (D)  $g < |g| < g^2$
- (E)  $|g| < g < g^2$

How do we know to pick numbers?

question is based  
on variable

What number should we pick?

## Sets and Intersections

A **set** is a collection of elements (usually numbers) that have a common characteristic.

E is the set of all even integers.

S is the set of all integers greater than 7.

An **intersection** is where two sets overlap. It is what they have in common.

What is the intersection of the set of people in this room and the set of Fishburne Cadets?

What is the intersection of the set E with the set S?

3. If X is the set of positive multiples of 2, and Y is the set of positive multiples of 3, then the intersection of X and Y is:

- (A) the set of all positive integers
- (B) the set of all positive real numbers
- (C) the set of all positive multiples of 3
- (D) the set of all positive multiples of 2
- (E) the set of all positive multiples of 6

When solving set/intersection problems it is helpful to list the members of the sets

Homework: p.39-42