

MES44-QC-Lesson 6

Mr. Pineda

Aim: How can we solve consecutive integer problems leading to a quadratic equation?

Do Now:

1) What is the next number

- a. 4,6,8, 10
- b. 3,5,7, 9
- c. 6,7,8, 9
- d. $x, x+1, \underline{x+2}$
- e. $x, x+2, \underline{x+3}$

even: (PAR) ex 2,4,6,8...

ODD: (IMPAR) ex 1,3,5,7...



2) If x represents an even integer, represent the next even integer in terms of x .

$x, x+2, x+4$

3) If x represents an odd integer represent, in terms of x , the odd integer that precedes x .

$x-2, x, x+2$
3 5 7

4) If $2n$ represents an even integer represent, in terms of n , the next integer. (Is it even or odd?)

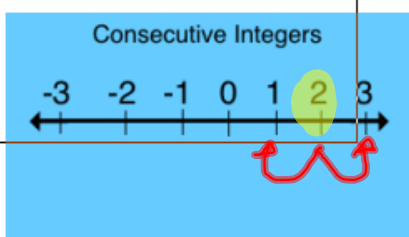
$2n, 2n+1$
even odd

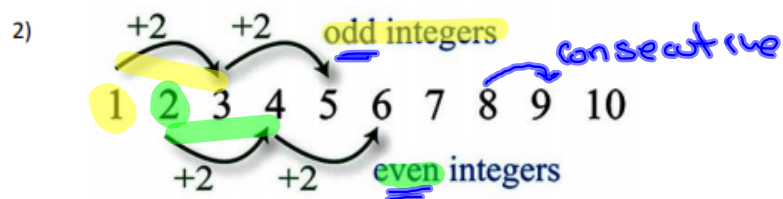
5) If n is an odd integer is $3n$ even or odd?

$(\text{O}) n \rightarrow 3(\text{O}) = 21$
odd odd

I – Consecutive Integers

1)





3) Examples:

3 consecutive integers \rightarrow $x, x+1, x+2$

3 consecutive even integers \rightarrow $x, x+2, x+4$

3 consecutive odd integers \rightarrow $x, x+2, x+4$

The image shows three rows of handwritten mathematical examples. Each row starts with a text label, followed by a sequence of numbers, an arrow, and a boxed algebraic expression. The first row is for '3 consecutive integers' with the example '2, 3, 4' and the expression 'x, x+1, x+2'. A red checkmark is above the text, and red arrows point from the numbers to the expression. The second row is for '3 consecutive even integers' with the example '2, 4, 6' and the expression 'x, x+2, x+4'. Red arrows point from the numbers to the expression. The third row is for '3 consecutive odd integers' with the example '3, 5, 7' and the expression 'x, x+2, x+4'. A blue underline is under the numbers, and blue arrows point from the numbers to the expression. A blue bracket is on the right side of the last two rows.

impares

II - Model Problems

1) How do you find an algebraic solution?

Example 1

- The sum of three consecutive integers is 66. What are the three integers?

Sum

$$\begin{array}{l} 21 = 1) \ x \\ 22 = 2) \ (x+1) \\ 23 = 3) \ (x+2) \end{array} \left. \vphantom{\begin{array}{l} 21 \\ 22 \\ 23 \end{array}} \right\} \begin{array}{l} x + (x+1) + (x+2) = 66 \\ 3x + 3 = 66 \\ x = 21 \end{array}$$

1st 21
2nd 22
3rd 23

2) Find two consecutive odd integers whose product is 99.

multiplication

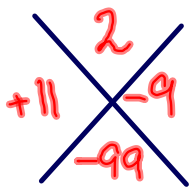
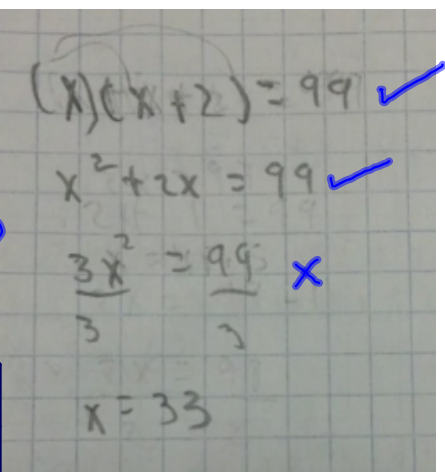
1) $x = 9$

2) $x + 2 = 11$

$x(x+2) = 99$

$x^2 + 2x = 99$

$x^2 + 2x - 99 = 0$

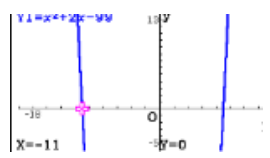
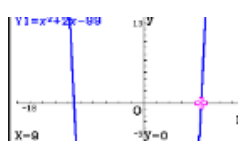


	x	-9
x	x^2	$-9x$
11	$11x$	-99

$(x-9)(x+11) = 0$

$x = 9$
ODD

$x = -11$
ODD **Reject**



3) A certain number added to its square is 30. Find the number.

$$x + x^2 = 30$$

Handwritten work on lined paper showing the solution to the equation $x + x^2 = 30$. The work includes the equation, factoring to $(x+6)(x-5) = 0$, and the solutions $x = -6$ and $x = 5$. The solution $x = 5$ is boxed, and $x^2 = 25$ is also boxed.

$$x^2 + x - 30 = 0 \quad (x+6)(x-5)$$
$$x \quad +6 \quad x+6=0 \quad x-5=0$$
$$x \quad -5 \quad x=-6 \quad x=5$$
$$5 + 5^2 =$$
$$5 + 25 = 30$$
$$(x+6)(x-5) = 0$$
$$x = -6 \quad \boxed{x = 5}$$
$$\boxed{x^2 = 25}$$

III – Exercises

- 1) Find two consecutive positive integers such that the square of the first decreased by 17 equals 4 times the second.

complete on your own

- 2) The ages of three family children can be expressed as consecutive integers. The square of the age of the youngest child is 4 more than eight times the age of the oldest child. Find the ages of the three children.

complete on your own

- 3) Find two consecutive integers whose product is 24 more than three times the first integer

complete on your own

