Consecutive Integer Problems

4. a) Complete the charts using ***consecutive*** integers.

> ***Consecutive:***
> Following one after another in order – in an uninterrupted sequence.

Consecutive Integers:			
First Integer	Second Integer	Third Integer	Sum of all Three Consecutive Integers
1	2	3	1 + 2 + 3 = 6
10	11	12	10+11+12 = 33
29	30	31	29+30+31 = 90
n	n+1	n+2	n+n+1+n+2 = 3n+3

First **Even** Integer	Second **Even** Integer	Third **Even** Integer	Sum of all Three **Even** Integers
2	4	6	2 + 4 + 6
16	18	20	16+18+20
n	n+2	n+4	

First **Odd** Integer	Second **Odd** Integer	Third **Odd** Integer	Sum of all Three **Odd** Integers
1	3	5	1+3+5
29	31	33	29+31 + 33
n	n+2	n+4	n+n+2+n+4

Using the ideas from the charts above, solve the following problems **in your notebooks.**

b) Determine three consecutive integers whose sum is 246.
(** ***'Let n, n+1, n+2 represent the numbers'*** should be the opening statement)

c) Determine three consecutive integers whose sum is 1026.

d) Determine four consecutive integers whose sum is 490.

e) Determine four consecutive integers whose sum is 106.

f) Determine five consecutive integers whose sum is –115.

g) Determine three consecutive odd integers whose sum is 39.

h) Determine three consecutive even integers whose sum is 222.

i) There are three consecutive integers so that when the double of the first is added to triple the second and then added to double the third, the result is 406. Determine the original integers.

j) There are four consecutive even integers. When double the third is subtracted from the sum of the first two, the result is . . . ?

Answers:

3. a) Erie 60m, Ontario 240m b) Angel 1000m, Niagara 50m c) Erie 387km, Ontario 310km
d) Lacey 18, Joey 6 e) Bill 19, Mother 41 f) 3, 8
4. b) 81,82,83 c) 341,342,343 d) 121, 122, 123, 124
e) 25, 26, 27, 28 f) –25, –24, –23, –22, –21 g) 11, 13, 15
h) 72, 74, 76 i) 57,58,59

b. Let $n, n+1, n+2$ represent the numbers

$$n+(n+1)+(n+2)=246$$
$$n+n+1+n+2=246$$
$$3n+3-3=246-3$$
$$\frac{3n}{3}=\frac{243}{3}$$
$$\boxed{n=81}$$

$\therefore$ The numbers are $81, 82, 83$

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c. Let $n, n+1, n+2$ be the numbers.

$$n+n+1+n+2=1026$$
$$3n+3-3=1026-3$$
$$\frac{3n}{3}=\frac{1023}{3}$$
$$n=341$$

$\therefore$ The numbers are $341, 342, 343$

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d. Let $n, n+1, n+2, n+3$ represent the numbers

$$n+n+1+n+2+n+3=490$$
$$4n+6-6=490-6$$
$$\frac{4n}{4}=\frac{484}{4}$$
$$\boxed{n=121}$$

$\therefore$ The numbers are $121, 122, 123, 124$

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f. Let $n, n+1, n+2, n+3, n+4$ rep. the numbers

$$n+n+1+n+2+n+3+n+4=-115$$
$$5n+10-10=-115-10$$
$$\frac{5n}{5}=\frac{-125}{5}$$
$$\boxed{n=-25}$$

$\therefore$ The numbers are $-25, -24, -23, -22, -21$

g. Let $n, n+2, n+4$ be the #

$$n+n+2+n+4 = 39$$
$$3n+6-6 = 39-6$$
$$\frac{3n}{3} = \frac{33}{3}$$
$$\boxed{n = 11}$$

$\therefore$ The numbers are $11, 13, 15$

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h. Let $n, n+2, n+4$ rep. the #s

$$n+n+2+n+4 = 222$$
$$3n+6-6 = 222-6$$
$$\frac{3n}{3} = \frac{216}{3}$$
$$\boxed{n = 72}$$

$\therefore$ The numbers are $72, 74, 76$

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i. Let $n, n+1, n+2$ rep. #s.

$$2n + 3(n+1) + 2(n+2) = 406$$
$$2n + 3n + 3 + 2n + 4 = 406$$
$$7n + 7 - 7 = 406 - 7$$
$$\frac{7n}{7} = \frac{399}{7}$$
$$\boxed{n = 57}$$

$\therefore$ The numbers are $57, 58, 59$

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j. Let $n, n+2, n+4, n+6$ rep. the numbers

Method 1 and sub 2 for n

2, 4, 6, 8 are possible four consecutive even integers.

$$(2+4) - 2(6) = 6-12$$
$$= -6$$

Method 2 or

$$= (n+n+2) - 2(n+4)$$
$$= 2n+2-2n-8$$
$$= -6 //$$

1. a) The ages of Sean and Ricky add up to 21.
   i) Use the table at right to show possible ages.
   ii) Determine the difference in their ages.
   b) Use the table to help solve the following problem:

The ages of Sean and his younger brother Ricky add up to 21. If the difference of their ages is 13, determine their ages.

Sean's Age	Ricky's Age	Difference in Ages
20	1	20 – 1 = 19
19	2	19 – 2 = 17
15	6	15 – 6 = 9
a	21 – a	a – (21 – a) = 2a – 21

Let "a" rep Sean's age

Sean	Ricky
a	21 – a

$a - 1(21 - a) = 13$
$a - 21 + a = 13$
$2a - 21 \overset{+21}{} = 13 + 21$
$\frac{2a}{2} = \frac{34}{2}$
$a = 17$

∴ Sean is 17 years old
Ricky is 4 years old

2. a) The sum of two numbers is 73.
   i) Use the table to show possible numbers.
   ii) Determine twice the second number.
   iii) Determine the first number plus twice the second number.
   b) Use the table to help solve the following problem:

The sum of two numbers is 73. The first number plus twice the second number is 118. Determine the two numbers.

First Number	Second Number	Twice the Second Number	The First Plus Twice the Second
1	72	2 × 72	1 + 2 × 72
2	71	2 × 71	2 + 2 × 71
10	63	2 × 63	10 + 2 × 63
n	73 – n	2(73 – n)	n + 2(73 – n)

let "n" rep 1st #

1st	2nd
n	73 – n

$n + 2(73 - n) = 118$
$n + 146 - 2n = 118$
$146 - n = 118$
$-n = 118 - 146$
$-n = -28$
$n = 28$

∴ The numbers are 28 and 73 – 28 = 45

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4. a) The sum of two numbers is 85. Twice one number plus four times the other is 218. Determine the numbers.

   b) One number is 25 more than another. Twice the larger is 5 more than 7 times the smaller number. Determine the numbers.

   c) The sum of two numbers is 125. Five times one of the numbers minus three times the other is 297. Determine the numbers.

a. Let "n" rep the num.

1st	2nd
n	$85-n$

$2n + 4(85-n) = 218$

$2n + 340 - 4n = 218$

$-2n + 340 - 340 = 218 - 340$

$\frac{-2n}{-2} = \frac{-122}{-2}$

$n = 61$

∴ The numbers are 61 and $85-61=24$

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b. Let "n" rep the first number

1st	2nd
n	$n+25$

$2(n+25) = 7n+5$

$2n + 50 - 5 = 7n + 5 - 5$

$2n + 45 - 2n = 7n - 2n$

$\frac{45}{5} = \frac{5n}{5}$

$n = 9$

∴ The numbers are 9 and 34

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c. Let "n" rep the first number

1st	2nd
n	$125-n$

$5n - 3(125-n) = 297$

$5n - 375 + 3n = 297$

$8n - 375 + 375 = 297 + 375$

$\frac{8n}{8} = \frac{672}{8}$

$n = 84$

∴ The numbers are 81 and $125-81=45$