Extra Sequences and Series Practice Questions

1) The terms $5x+2$, $7x-4$, and $10x+6$ are consecutive terms of an arithmetic sequence. Determine the value of x and the 3 terms.

1st term 2nd 3rd

common difference b/w 2nd & 1st term = common difference b/w 3rd & 2nd term

$-$ 1st term $=$ 3rd term $-$ 2nd term

$(7x-4)-(5x+2)=(10x+6)-(7x-4)$

$7x-4-5x-2=10x+6-7x+4$

$2x-6=3x+10$

$-2x\ -10\quad\quad -2x\ -10$

$\boxed{-16=x}$

$5x+2$	$7x-4$	$10x+6$
$5(-16)+2$	$7(-16)-4$	$10(-16)+6$
$-80+2$	$-112-4$	$-160+6$
$=\boxed{-78}$	-116	-154

2) The sum of the first 2 terms of an arithmetic series is 13 and the sum of the first four terms is 46. Determine the first 3 terms of the series and the sum of the first 6 terms.

n=2 $S_2=13$ n=4 $S_4=46$

$S_4=46$, $n=4$

$S_n=\frac{n}{2}(2a+(n-1)d)$

$46=\frac{4}{2}(2a+(4-1)d)$

$46=2(2a+3d)$

$\boxed{46=4a+6d}$

$S_2=13$, $n=2$

$S_n=\frac{n}{2}(2a+(n-1)d)$

$13=\frac{2}{2}(2a+(2-1)d)$

$13=2a+d$

$-2a\quad -2a$

$\boxed{13-2a=d}$

$13-2(4)=d$

$13-8=d$

$\boxed{5=d}$

SUBSTITUTION

$46=4a+6d$

$46=4a+6(13-2a)$

$46=4a+78-12a$

$46=-8a+78$

$-78\quad\quad -78$

$-32=-8a$

$\frac{-32}{-8}=\frac{-8a}{-8}$

$\boxed{4=a}$

$S_n=\frac{n}{2}(2a+(n-1)d)$

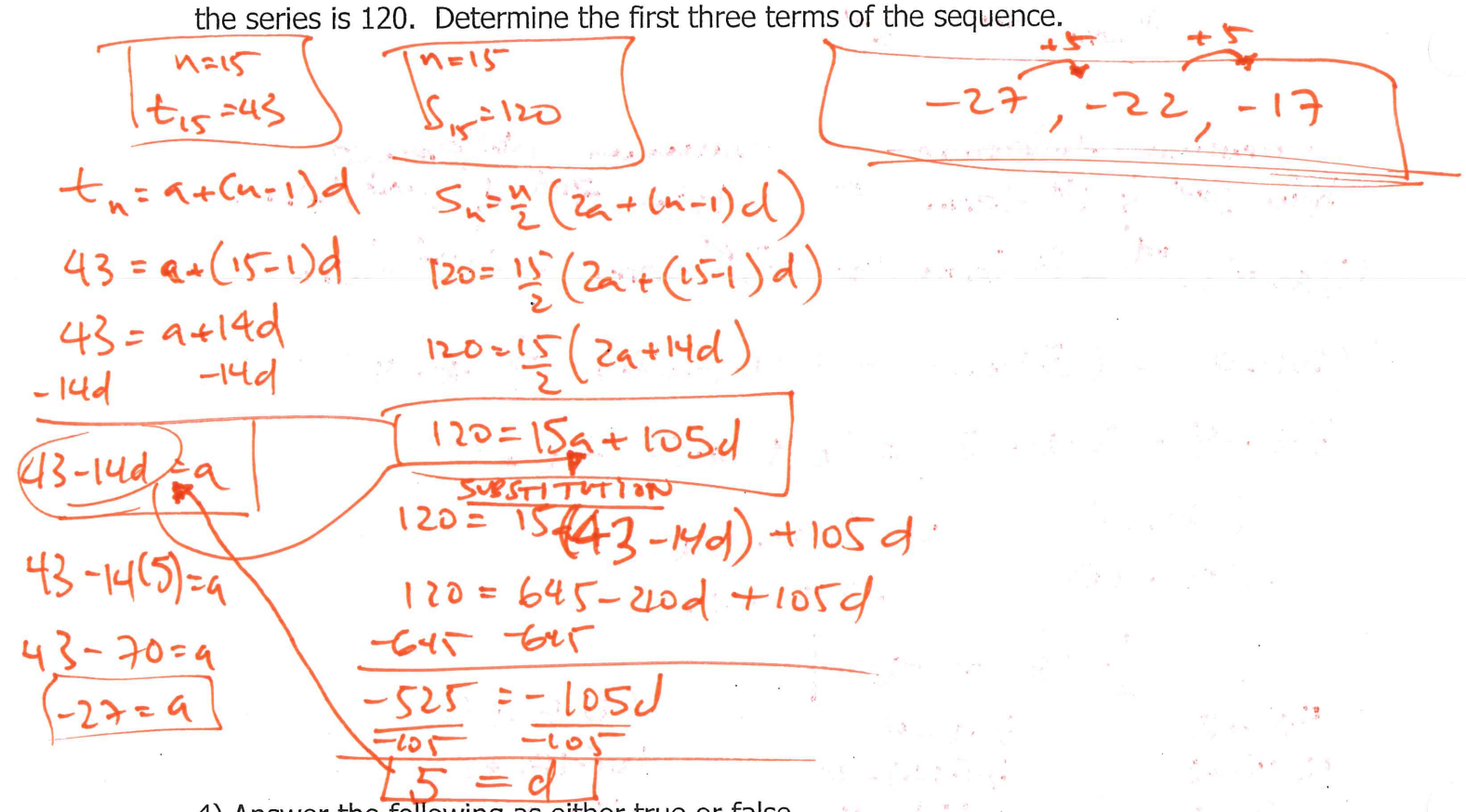
$S_6=\frac{6}{2}(2(4)+(6-1)5)$

$=3(8+25)$

$=3(33)=\boxed{99}$

4, 9, 14 (+5, +5)

3) The 15th term of an arithmetic sequence is 43 and the sum of the first 15 terms of the series is 120. Determine the first three terms of the sequence.



4) Answer the following as either true or false.

a) Doubling each term of an arithmetic series will double the sum of the series.

True b/c doubling common difference

b) Keeping the first term constant and doubling the number of terms will double the sum of the series.

False

c) If each term of an arithmetic sequence is multiplied by a fixed number, the resulting sequence will always be an arithmetic sequence.

True b/c multiplying common difference.

Answers

1) x=-16, terms:-78, -116, -154 2) 4, 9, 14, $S_6 = 99$ 3) -27, -22, -17 4a) T b) F c)T