Arithmetic Progression Intro Questions
(Sequence and Series)

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(This slide so that slides print out nicely as 6-slides-horizontal per page)

1, 3, 5, 7…

a =

d =

u_n =

u_{10} =

-6, -6.5, -7, -7.5…

a =

d =

u_n =

u_{10} =

1

1, 3, 5, 7…

a = 1

d = 2

$u_n = a + (n-1)d = 1 + 2(n-1) = 2n - 1$

$u_{10} = 19$

-6, -6.5, -7, -7.5…

a = -6

d = -0.5

$u_n =$

$a + (n-1)d = -6 - 0.5(n-1) = -0.5n - 5.5$

$u_{10} = -10.5$

$u_1 = 6$

$d = -3$

$u_n =$

$u_7 =$

$u_2 = 5$

$d = 0.25$

$u_n =$

$u_{100} =$

2

$u_1 = 6$

$d = -3$

$u_n = a + (n-1)d = 6 - 3(n-1) = 9 - 3n$

$u_7 = -12$

$u_2 = 5$

$d = 0.25$

$u_n =$

$a + (n-1)d$

$= 4.75 - 0.25(n-1) = 4.5 + 0.25n$

$u_{100} = 29.5$

2

$u_2 = 7$
$u_4 = 15$

d =

a =

$u_9 =$

_____ ____ ____ ____

$u_2 = -1$
$u_6 = 15$

d =

a =

$u_{12} =$

3

$u_2 = 7$

$u_4 = 15$

$d = 4$

$a = 3$

$u_9 = 35$

$u_2 = -1$

$u_6 = 15$

$d = 4$

$a = -5$

$u_{12} = 39$

	7		15
3		11	

	-1				15
-5		3	7	11	

3

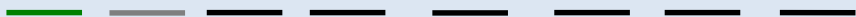$u_3 = -7$

$u_8 = -27$

$a =$

$d =$

$u_{10} =$

$u_3 = -7$

$u_{10} = -6$

$d =$

$a =$

$u_{12} =$

4
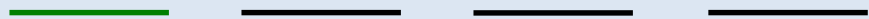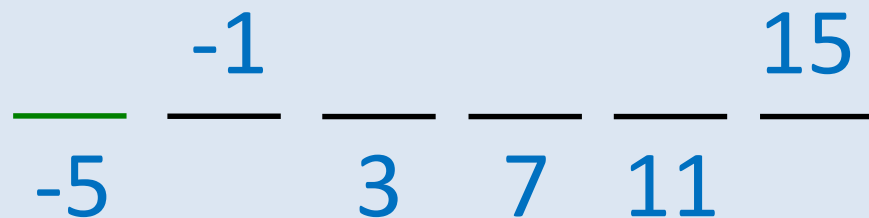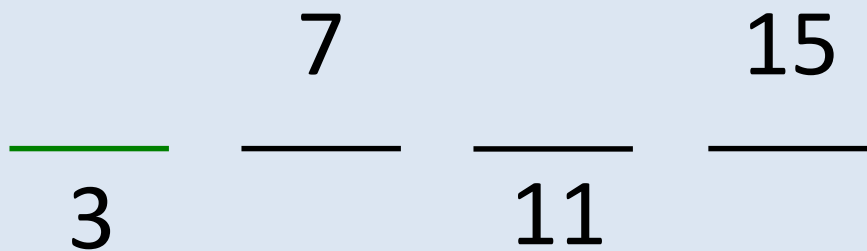
$$u_3 = -7$$
$$u_8 = -27$$

a = 1

$$d = \frac{-27 - -7}{5} = \frac{-20}{5} = -4$$

$$u_{10} = -35$$

$$\underline{\quad} \; \underline{\quad} \; \underset{-7}{\underline{\quad}} \; \underline{\quad} \; \underline{\quad} \; \underline{\quad} \; \underline{\quad} \; \underset{-27}{\underline{\quad}} \; \underline{\quad}$$

$$u_3 = -7$$
$$u_{10} = -6$$

a =

$$d = \frac{-6 - -7}{7} = \frac{1}{7}$$

$$u_{12} = -5\frac{5}{7}$$

4

$u_1 = 5$

$d = -2$

$u_5 =$

$S_5 =$

$u_{25} =$

$S_{25} =$

$u_1 = 5$

$d = -2$

5

$u_1 = 5$
$d = -2$

$u_5 = 5, 3, 1, -1, -3$

$S_5 = 5$

$u_1 = 5$
$d = -2$

$u_{25} = -43$

$S_{25} = -425$

3, 8, 13, 18...

a =

d =

u_n =

S_n =

u_8 =

S_8 =

3, 2, 1, 0...

a =

d =

u_n =

S_n =

u_8 =

S_8 =

6

3, 8, 13, 18…

3, 2, 1, 0…

a = 3

d = 5

$u_n = a + (n-1)d = 3 + 5(n-1) = 5n - 2$

$S_n = \frac{1}{2}n[2a+(n-1)d] = \frac{1}{2}n[6+5(n-1)] = \frac{1}{2}n[5n+1]$

$u_8 = 38$

$S_8 = \frac{8}{2}[40 + 1] = 4 \times 41 = 164$

(easier to use other formula?)

a = 3

d = -1

$u_n = 3 + (n-1) = 4 - n$

$S_n = \frac{1}{2}n[6+(n-1)] = \frac{n}{2}[7-n]$

$u_8 = -4$

$S_8 = -4$

6

7, 11, 15, 19...

$u_6 =$

$S_6 =$

6.5, 11, 15.5, 20...

$u_{10} =$

$S_{10} =$

7, 11, 15, 19…

$u_6 = 27$

$S_6 = 102$

6.5, 11, 15.5, 20…

$u_{10} = 47$

$S_{10} = 267.5$

10, 7, 4…

$u_6 =$

$S_n =$

10, -90, -190…

$u_6 =$

$S_n =$

10, 7, 4…

u_6 = …1, -2, -5

$S_n = \frac{1}{2}n[2a+(n-1)d]=\frac{1}{2}n[20+3(n-1)]=\frac{1}{2}n[3n+17]$
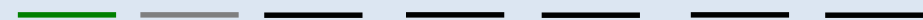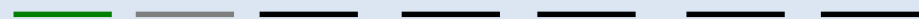
10, -90, -190…

u_6 = …-290, -390, -490

$S_n = \frac{1}{2}n[20-100(n-1)] = \frac{1}{2}n[19-100n]$

8

$u_3 = -5$

$u_7 = -21$

a =

d =

$S_7 =$

$u_3 = -11$

$u_7 = -21$

a =

d =

$S_7 =$

9

$u_3 = -5$

$u_7 = -21$
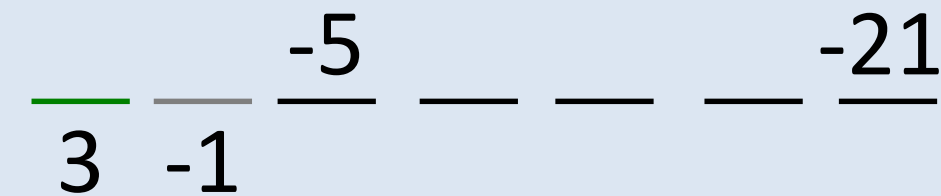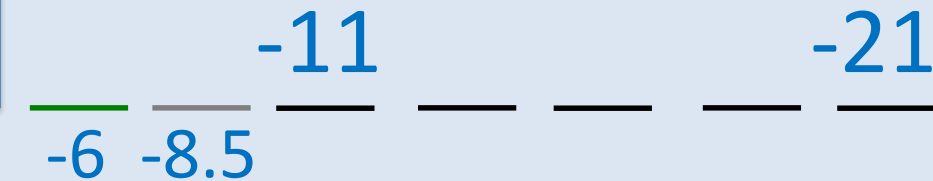
$a = 3$

$d = \dfrac{-21--5}{4} = \dfrac{-16}{4} = -4$

$S_7 = \dfrac{7}{2}(3-21) = \dfrac{-18\times7}{2} = -63$

$\underline{}\quad\underline{}\quad\overset{\text{-5}}{\underline{}}\quad\underline{}\quad\underline{}\quad\underline{}\quad\overset{\text{-21}}{\underline{}}$

3 -1

$u_3 = -11$

$u_7 = -21$

$a = -6$

$d = \dfrac{-21--11}{4} = \dfrac{-10}{4} = -2.5$

$S_7 = \dfrac{7}{2}(-6-21) = \dfrac{-27\times7}{2} = -94.5$

$\underline{}\quad\underline{}\quad\overset{\text{-11}}{\underline{}}\quad\underline{}\quad\underline{}\quad\underline{}\quad\overset{\text{-21}}{\underline{}}$

-6 -8.5

9

$u_{12} = -5$
$u_{20} = -13$

$S_{20} =$
$d =$
$a =$

$u_{12} = -5$
$u_{112} = -105$

$S_{20} =$
$d =$
$a =$

$u_{12} = -5$
$u_{20} = -13$

S_{20} = ...see below

$d = \frac{-13--5}{20-12} = \frac{-8}{8} = -1$

$a = -5 - (11 \times -1) = -5 + 11 = 6$

$S_{20} = \frac{20}{2} \times (6-13) = 10 \times -7 = -70$

$u_{12} = -5$
$u_{112} = -105$

$S_{20} =$

$d = \frac{-105--5}{112-12} = \frac{-100}{100} = -1$

$a = -5 - (11 \times -1) = -5 + 11 = 6$

$S_{20} = \frac{20}{2} \times (6-13) = 10 \times -7 = -70$

$u_{10} = 44$

$d = 4$

$a =$

$S_{10} =$

$u_{10} = 44$

$d = -3$

$a =$

$S_{10} =$

$u_{10} = 44$

$d = 4$

a =44-36=8

$S_{10} = \frac{10}{2}(44+8)=5\times52=260$

$u_{10} = 44$

$d = -3$

a =44+27=71

$S_{10} = \frac{10}{2}(44+71)=5\times115=575$

11

$$S_{10} = 135$$
$$a = 9$$

$$S_5 = 13$$
$$a = 3$$

d =

d =

$S_{10} = 135$

a = 9

d =

$$S_{10} = 135$$
$$= \frac{10}{2}[2\times9+(10-1)d]$$
$$= 5[18+9d]$$

$$9d = \frac{135}{5}-18$$
$$= 27 - 18$$
$$= 9$$

$$d = 1$$

$$u_{10} = a + (n-1)d$$
$$= 9 + 9 \times 1$$
$$= 18$$

$S_5 = 13$

a = 3

d =

$$S_5 = 13$$
$$= \frac{5}{2}[2\times3+(5-1)d]$$
$$= \frac{5}{2}[6+4d]$$

$$4d = \frac{13}{2.5} - 6$$
$$= -0.8$$

$$d = -0.2$$

$$u_9 = a + (n-1)d$$
$$= 3 + 8 \times -0.2$$
$$= 1.4$$

12

$$u_3 = 6$$
$$u_{13} = 41$$

d =

a =

S_{10} =

$$u_3 = 41$$
$$u_{13} = 6$$

d =

a =

S_{10} =

13

$u_3 = 6$

$u_{13} = 41$

d = $\frac{41-6}{13-3} = \frac{35}{10} = 3.5$

$S_{10} = \frac{n}{2}(a+l)$

a = -1

$S_{10} = \frac{n}{2}[2a + (n-1)d]$

$\quad = \frac{10}{2}[2 \times -1 + (10-1)$

$u_3 = 41$

$u_{13} = 6$

d = $\frac{6-41}{13-3} = \frac{-35}{10} = -3.5$

$S_{10} = \frac{n}{2}(a+l)$

a = 48

$S_{10} = \frac{n}{2}[2a + (n-1)d]$

$\quad = \frac{10}{2}[2 \times 48 + (10-1)$

13

$S_{10} = -90$

$d = -4$

$u_1 =$

$S_{10} = -90$

$d = -1.1$

$u_1 =$

1

S$_{10}$ = -90

d = -4

u$_1$ = ...see below

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

$$S_{10} =$$

$$-90 = \frac{10}{2}[2a + (10-1) \times -4]$$

$$-90 = 5[2a - 36]$$

$$-18 = 2a - 36$$

$$18 = 2a$$

$$9 = a$$

u$_1$ = 9

1

S$_{10}$ = -90

d = -1.1

u$_1$ = ...see below

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

$$S_{10} =$$

$$-90 = \frac{10}{2}[2a + (10-1) \times -1.1]$$

$$-90 = 5[2a - 9.9]$$

$$-18 = 2a - 9.9$$

$$-8.1 = 2a$$

$$-4.05 = a$$

u$_1$ = -4.05