

Sequences + Series Review + Pdun

$$1. a_1 = \frac{(2-1)!}{(2+1)!} = \frac{1}{3!} = \frac{1}{6} \qquad a_3 = \frac{(6-1)!}{(6+1)!} = \frac{5!}{7!} = \frac{1}{42}$$

$$a_2 = \frac{(4-1)!}{(4+1)!} = \frac{3!}{5!} = \frac{1}{20} \qquad a_4 = \frac{(8-1)!}{(8+1)!} = \frac{7!}{9!} = \frac{1}{72}$$

D

$$2. a_{21} = \frac{21(21+4)}{3} = \frac{21(25)}{3} = \boxed{175}$$

$$3. a_1 = -6(1) + 51 = 45 \qquad \boxed{45, 39, 33, 27, 21}$$

$$4. \boxed{A} \qquad \frac{9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}{4 \cdot 3 \cdot 2 \cdot 1} = 15120$$

$$5. \frac{(n+3)(n+2)(n+1)(n)(n-1)}{(n+2)(n+1)(n)(n-1)} \qquad \boxed{n+3=C}$$

$$6. \frac{7!}{3!4!} = \boxed{35}$$

$$7. \frac{(n+1)(n)(n-1)(n-2)(n-3)}{(n-2)(n-3)(n-4) \dots} = \boxed{(n+1)(n)(n-1)}$$

$$8. \sum_{i=1}^8 \frac{i^2}{i+2} = \boxed{6}$$

$$9. \sum_{N=1}^4 \frac{(-x)^{N+1}}{9+N}$$

$$10 \quad \boxed{D \quad 11/9}$$

$$S_N = \frac{a_1}{1-r}$$

$$\frac{1.1}{1-.1} = \frac{1.1}{.9} = 11/9$$

geometric $r = .1$

$$11 \quad \sum_{k=1}^{\infty} 2 \left(\frac{4}{7}\right)^k \quad r = 4/7 \quad a_1 = 8/7$$

$$\frac{8/7}{1-4/7} = \boxed{8/3}$$

$$12 \quad S_N = \frac{1}{2}(a_1 + a_N)$$

17 Rows so $N=17$

$$\text{Arithmetic} = \frac{17}{2}(1+17)$$

$$= \boxed{D \quad 153}$$

$$13 \quad 1999 - 1950 = 49$$

$$N = 49$$

$$.03(49) + .14 = \boxed{A. \quad \$1.61}$$

$$14. \quad a_1 = 7(40)^2 - 2(40) = 11,120$$

$$4 \text{ days} \rightarrow \sum_{N=1}^4$$

Skip!

$$15. \quad 13, 16, 19$$

a_1

a_{20}

Arithmetic $d = +3$

$$S_N = \frac{20}{2}(13+70)$$

$$\boxed{S_N = 830}$$

$$\boxed{a_N = 13 + (n-1)3}$$

$$a_8 = 13 + 7 \cdot 3 = \boxed{34}$$

$$a_{20} = 13 + (19)(3)$$

$$= \del{13} 70$$

16 No

17, $a_1 = 5$ $a_2 = -1$ $a_3 = -7$ $a_4 = -13$, $a_5 = -19$

difference = -6 $a_n = 11 - 6n$

18 (1, 11) (15, 28) $5 + (n-1)(-6)$

difference $\frac{28-11}{15-1} = \frac{17}{14}$ (A)

19 arithmetic $S_n = \frac{n}{2}(a_1 + a_n)$ a

$a_1 = 2(1) - 4$
 $= -2$

$\frac{30}{2}(-2 + 56) = \boxed{810}$

$a_{30} = 56$

20 $\sum_{n=1}^{16}$

difference = 10 $a_1 = 19$

$a_n = 19 + (n-1)(10)$ $a_{16} = 19 + 15(10)$
 $a_{16} = 169$

$= \frac{16}{2}(19 + 169)$

$= \boxed{1504}$

21 \boxed{D} $d = 1342$ $a_1 = 21,435$

$21435 + (n-1)1342 = \boxed{20,093 + 1342n}$

23

$N=18$

$a_{18} = ?$

$a_1 = 1$

$1, 6, 11, \dots$

$a_N = 1 + (N-1)5$

$a_{18} = 1 + (17)5 = 86$

$$\frac{18}{2}(1+86) = \boxed{783}$$

24

Yes = $\frac{1}{2}$

25

$a_1 = 7$

$a_2 = -1.4 \times 7 = -9.8$

$a_3 = 13.72$

$r = -1.4$

$a_N = 7(-1.4)^{N-1}$

26

$a_N = -1(2)^{N-1}$

$a_7 = -1(2)^6 = \boxed{B = -64}$

27

$a_N = \frac{16}{3} \left(\frac{8}{3}\right)^{N-1}$

$r = \frac{8}{3}$

28

$S_N = a_1 \left(\frac{1-r^N}{1-r}\right)$

$\frac{1}{2} \left(\frac{1-\frac{1}{2}^3}{1-\frac{1}{2}}\right) = \frac{1}{2} \left(\frac{\frac{7}{8}}{\frac{1}{2}}\right) = \boxed{\frac{7}{8}}$

29

$S_N = 10 \left(\frac{1-\frac{4}{5}^5}{1-\frac{4}{5}}\right) = \boxed{33.62 \text{ A}}$

ration $\frac{4}{5}$

$$30 \quad N=0 \quad \left(\frac{1}{3}\right)^0 = 1$$

$$1 + \sum_{N=1}^6 \left(\frac{1}{3}\right)^N$$

$$1 + \frac{1}{3} \left(\frac{1 - \frac{1}{3}^6}{1 - \frac{1}{3}} \right)$$

$$1 + .4993 = \boxed{1.499}$$

$$31. \quad r = 3/4$$

~~4/10/10/10~~

$$S_N = \frac{a_1}{1-r}$$

$$\frac{4}{1 - 3/4} = \boxed{16}$$

$$32. \quad r = \boxed{1/9}$$

$$\frac{1}{1-1} = 1/9$$

$$r = 0.1$$

$$33. \quad r = -3/4$$

$$\frac{4}{1 - (-3/4)} = \textcircled{16/7}$$

$$34. \quad \frac{3}{1 - (-1/4)} = \textcircled{12/5}$$

NEB11

$$35. \quad S_N = \frac{N}{2} (a_1 + a_{100})$$

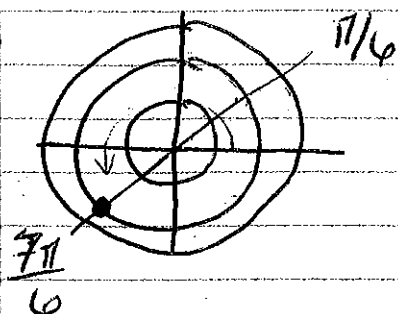
$$1 - 211 = 106 \text{ Terms}$$

$$11236 = \frac{106}{2} (1 + 211) \checkmark$$

$$S_N = \frac{156}{2} (1 + 311) = \boxed{24336}$$

Polar Review

①



$$(2, 7\pi/6)$$

$$(2, -5\pi/6)$$

$$(-2, -11\pi/6)$$

②

$$A) (-3\cos 5\pi/6, -3\sin 5\pi/6) = (2.598, -1.5)$$

$$B) (3\cos^{-7\pi/12}, 3\sin^{-7\pi/12}) = (-1.776, -2.897)$$

③

$$A) (-3, 1)$$

When ~~in~~ in 2nd/3rd must adjust!

$$r^2 = -3^2 + 1^2 = r = \sqrt{10}$$

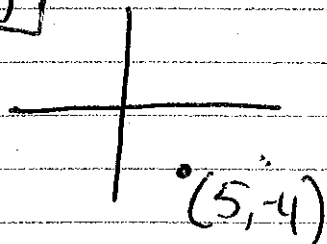
$$\tan^{-1}(-1/3) = -.321$$

This is 4th quadrant

$$(-\sqrt{10}, -.321)$$

$$(\sqrt{10}, 2.819)$$

L B)



When in 1st/4th answer is correct as is

$$r^2 = 25 + 16 = r = \sqrt{41}$$

$$\tan^{-1}(-4/5) = -.675$$

$$(\sqrt{41}, -.675)$$

4.

$$r^2 = 4r\cos\theta$$

$$x^2 + y^2 = 4x$$

$$x^2 - 4x + y^2 = 0$$

$$\boxed{(x-2)^2 + y^2 = 4}$$