

**A.SSE.B.4: Series 2**

- 1 Beginning July 1, 2019, Michelle deposited \$250 into an account that yields 0.15% each month. She continued to make \$250 deposits into this account on the first of each month for 3 years. Which expression represents the amount of money that was in the account after her last deposit was made on June 1, 2022?
- 1)  $250(1.0015)^3$
  - 2)  $250(1.0015)^{36}$
  - 3)  $\frac{250 - 250(1.0015)^3}{1 - 1.0015}$
  - 4)  $\frac{250 - 250(1.0015)^{36}}{1 - 1.0015}$
- 2 John and Margaret deposit \$500 into a savings account for their son on his first birthday. They continue to make a deposit of \$500 on the child's birthday, with the last deposit being made on the child's 21st birthday. If the account pays 4% annual interest, which equation represents the amount of money in the account after the last deposit is made?
- 1)  $S_{21} = 500(1.04)^{21}$
  - 2)  $S_{21} = \frac{500(1 - 1.04^{21})}{1 - 1.04}$
  - 3)  $S_{21} = 500(1.04)^{20} + 500$
  - 4)  $S_{21} = \frac{500(1 - 0.04^{21})}{1 - 1.04}$
- 3 Jasmine decides to put \$100 in a savings account each month. The account pays 3% annual interest, compounded monthly. How much money,  $S$ , will Jasmine have after one year?
- 1)  $S = 100(1.03)^{12}$
  - 2)  $S = \frac{100 - 100(1.0025)^{12}}{1 - 1.0025}$
  - 3)  $S = 100(1.0025)^{12}$
  - 4)  $S = \frac{100 - 100(1.03)^{12}}{1 - 1.03}$
- 4 Jake wants to buy a car and hopes to save at least \$5000 for a down payment. The table below summarizes the amount of money he plans to save each week.

<b>Week</b>	1	2	3	4	5
<b>Money Saved, in Dollars</b>	2	5	12.5	31.25	...

Based on this plan, which expression should he use to determine how much he has saved in  $n$  weeks?

- 1)  $\frac{2 - 2(2.5^n)}{1 - 2.5}$
  - 2)  $\frac{2 - 2(2.5^{n-1})}{1 - 2.5}$
  - 3)  $\frac{1 - 2.5^n}{1 - 2.5}$
  - 4)  $\frac{1 - 2.5^{n-1}}{1 - 2.5}$
- 5 The sum of the first eight terms of the series  $3 - 12 + 48 - 192 + \dots$  is
- 1)  $-13,107$
  - 2)  $-21,845$
  - 3)  $-39,321$
  - 4)  $-65,535$
- 6 The sum of the first 20 terms of the series  $-2 + 6 - 18 + 54 - \dots$  is
- 1)  $-610$
  - 2)  $-59$
  - 3)  $1,743,392,200$
  - 4)  $2,324,522,934$
- 7 The first term of a geometric sequence is 8 and the fourth term is 216. What is the sum of the first 12 terms of the corresponding series?
- 1) 236,192
  - 2) 708,584
  - 3) 2,125,760
  - 4) 6,377,288



**A.SSE.B.4: Series 2****Answer Section**

1 ANS: 4 REF: 012423a11

2 ANS: 2 REF: 062324a11

3 ANS: 2 REF: 061724a11

4 ANS: 1 REF: 081813a11

5 ANS: 3

$$S_8 = \frac{3(1 - (-4)^8)}{1 - (-4)} = \frac{-196,605}{5} = -39,321$$

REF: 061304a2

6 ANS: 3

$$S_{20} = \frac{-2 - (-2)(-3)^{20}}{1 - (-3)} = 1,743,392,200$$

REF: 012306a11

7 ANS: 3

$$8r^3 = 216 \quad S_{12} = \frac{8 - 8(3)^{12}}{1 - 3} = 2125760$$

$$r^3 = 27$$

$$r = 3$$

REF: 081902a11

8 ANS: 4

$$S_n = \frac{32 - 32(.8)^{12}}{1 - .8} \approx 149$$

REF: 081721a11

9 ANS: 4

$$S_{15} = \frac{10 - 10(1.09)^{15}}{1 - 1.09} \approx 293.609$$

REF: 062424a11

10 ANS: 4

$$S_5 = \frac{350 - 350(1.15)^5}{1 - 1.15} \approx 2360$$

REF: 012524a11

11 ANS: 4

$$S_7 = \frac{85000 - 85000(1.06)^7}{1 - 1.06} \approx 713476.20$$

REF: 061905a11

12 ANS: 4

$$S_{10} = \frac{90000 - 90000(1.02)^{10}}{1 - 1.02} \approx 985,475$$

REF: 082424aai

13 ANS: 2

$$S_{20} = \frac{.01 - .01(3)^{20}}{1 - 3} = 17,433,922$$

REF: 011822aai

14 ANS:

$$r = \frac{360}{300} = 1.2 \quad S_n = \frac{300 - 300(1.2)^n}{1 - 1.2} \quad S_{10} = \frac{300 - 300(1.2)^{10}}{1 - 1.2} \approx 7787.6$$

REF: 012029aai

15 ANS:

$$S_5 = \frac{6 - 6(.8)^5}{1 - .8} \approx 20.17$$

REF: 062226aai

16 ANS:

$$S_{10} = \frac{15 - 15(1.03)^{10}}{1 - 1.03} \approx 171.958$$

REF: 011929aai

17 ANS:

$$a_n = 100(.8)^{n-1} \quad S_{20} = \frac{100 - 100(.8)^{20}}{1 - .8} \approx 494 \quad \text{No, because } 494 > 40 \times 12.$$

REF: 012033aai

18 ANS:

$$S_n = \frac{33000 - 33000(1.04)^n}{1 - 1.04} \quad S_{15} = \frac{33000 - 33000(1.04)^{15}}{1 - 1.04} \approx 660778.39$$

REF: 061634aai