

Revision Exercise (Sequences)

1.

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|----------|----------|-------------------------------|
| a) 91 | d) 84 | g) $T_{16} = 77; T_{20} = 97$ |
| b) -39 | e) -85 | h) -1 |
| c) 890 | f) No | i) 51 |

2.

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|---------|---------------------|----------|
| a) 2380 | c) $318\frac{3}{4}$ | e) 10000 |
| b) 3320 | d) 10100 | f) 915 |

3.

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|------------------------------------|-------|------|
| a) 2×3^{19} or 2324522934 | d) 10 | g) 9 |
| b) 24576 | e) 16 | |
| c) 12 | f) 21 | |

4.

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|----------------------------|-----------------------|--------------------------|--------------------------|
| a) (i) 3069 | b) 5115 | e) (ii) $-\frac{50}{11}$ | f) (ii) $\frac{1}{3}$ |
| a) (ii) -381 | c) 789.309 | e) (iii) 100 | f) (iii) $\frac{10}{99}$ |
| a) (iii) $\frac{5187}{32}$ | d) -5.9999 | e) (iv) $\frac{5}{9}$ | |
| a) (iv) $\frac{6375}{64}$ | e) (i) $\frac{15}{4}$ | f) (i) $\frac{4}{9}$ | f) (iv) $\frac{5}{9}$ |

5.

- | | |
|------------------------------------|--|
| a) $\lg z - \lg y = \lg y - \lg x$ | b) $(x + y) - (x + z) = (x + z) - (y + z)$ |
|------------------------------------|--|

6.

- a) $S_n = n^2 + 9n$. Minimum number of terms required is 28.
b) $S_n = \frac{5}{2}n^2 + \frac{5}{2}n$. Minimum number of terms required is 63.

7.

- a) $a = 2, d = 3, T_n = 2 + (n - 1)3 = 3n - 1, S_n = \frac{n}{2}(2(2) + (n - 1)3) = \frac{1}{2}n(3n + 1)$
b) $T_{40} = 119, S_n = 2420$
c) 1810

8.

Salary for year 2020 = \$100000

Salary from 2000 to 2019 inclusive = \$1475000

9.

a) $n > 21.24 \Rightarrow n = 22$

b) $n > 27.86 \Rightarrow n = 28$

10.

a) $a = 17, b = 24$

c) $a = 0, b = 6, S_{15} = 210$

b) $a = -2, b = 10$

d) $a = 1, b = 8, S_8 = 255$

11.

a) Geometric Progression with $r = \frac{1}{2}$

b) $T_{10} = \frac{3}{512}$

c) $S_{12} = \frac{12285}{2048}$ or 5.9985

12.

a) $r = 0$ (Trivial case) and $r = 3$

b) $b = -4$

c) $x = 2$

13.

a) 5100

b) 8200

c) 338

d) 1125

e) 125001

14.

a) $\frac{1}{9}$

c) $\frac{1}{11}$

e) $\frac{1}{30}$

b) $\frac{5}{9}$

d) $\frac{5}{111}$

f) $\frac{23}{111}$

15.

a) $3 + 3 + 3 + 3 + 3 + 3$

b) $5(3) + 5(4) + 5(5) + 5(6)$

c) $(1^2 + 1) + (2^2 + 1) + (3^2 + 1) + (4^2 + 1) + (5^2 + 1) + (6^2 + 1) + (7^2 + 1)$

d) $(5 + \frac{2}{5^2}) + (6 + \frac{2}{6^2}) + (7 + \frac{2}{7^2}) + (8 + \frac{2}{8^2}) + (9 + \frac{2}{9^2}) + (10 + \frac{2}{10^2})$

e) $2^3 + 3^3 + 4^3 + 5^3 + 6^3 + 7^3 + 8^3$

f) $29^2 + 31^2 + 33^2 + 35^2$

g) $-1 + 2 - 3 + 4 - 5$

h) $(1)^2 - (2)^2 + (3)^2 - (4)^2 + (5)^2$

i) $2 - 3 + 4 - 5 + 6 - 7 + 8$

j) $2 + 0 + 2 + 0 + 2 + 0$

k) $\frac{0}{1} + \frac{1}{2} + \frac{0}{3} + \frac{1}{4} + \frac{0}{5}$

l) $\sin\left(\frac{2\pi}{10}\right) + \sin\left(\frac{2\pi}{11}\right) + \sin\left(\frac{2\pi}{12}\right) + \sin\left(\frac{2\pi}{13}\right) + \sin\left(\frac{2\pi}{14}\right) + \sin\left(\frac{2\pi}{15}\right)$

16.

a) $\sum_{r=1}^4 r^2$

c) $\sum_{r=1}^4 (-1)^r \cdot r^2$

e) $\sum_{r=1}^6 (3r - 2)$

g) $\sum_{r=1}^4 \frac{r}{(r+1)^2+1}$

i) $\sum_{r=1}^4 \frac{r}{(r+1)(r+3)}$

b) $\sum_{r=1}^4 (-1)^{r+1} \cdot r^2$

d) $\sum_{r=1}^7 (2r + 1)$

f) $\sum_{r=3}^6 \frac{1}{r}$

h) $\sum_{r=1}^4 \frac{r}{(r+2)^2+(r+1)}$

j) $\sum_{r=1}^3 r \cos\left(\frac{r}{\pi}\right)$

17.

a) 6000

c) 2550

e) 85

g) 1550

b) 2485

d) 2600

f) 1860

h) 2604

18.

a) 69.83 cm

b) 15th swing

c) 1073.42 cm

d) 2000 cm

19.

a) 5.324 m

b) 16 times

c) 125.24 m

d) 148 m

20.

Choose Package 1.

Package 1 earns \$1400000.

Package 2 earns \$1375000.

Package 3 earns \$1052924.