Question 1

Determine whether the series converges or diverges. If it converges, find the sum.

$$\sum_{n=1}^{\infty} \frac{3^{n-1}}{4^n}$$

1. 1

2. $\frac{3}{4}$

3. $\frac{1}{4}$

4. $\frac{1}{3}$

5. diverges

6. none of the above

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2. $\frac{3}{4}$

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5. diverges

6. none of the above

1. 1

Solution

This is a geometric series with $r = \frac{3}{4}$ and $a = \frac{1}{4}$

Question 2

Determine whether the series converges or diverges. If it converges, find the sum.

$$\frac{1}{2^5} + \frac{1}{2^6} + \frac{1}{2^7} + \cdots$$

1. 1

2. $\frac{1}{4}$

3. $\frac{1}{16}$

4. $\frac{1}{8}$

5. diverges

6. none of the above

Question 2

Determine whether the series converges or diverges. If it converges, find the sum.

$$\frac{1}{2^5} + \frac{1}{2^6} + \frac{1}{2^7} + \cdots$$

1. 1

2. $\frac{1}{4}$

3. $\frac{1}{16}$

4. $\frac{1}{8}$

5. diverges

6. none of the above

3. $\frac{1}{16}$

Solution

This is a geometric series with $r = \frac{1}{2}$ and $a = \frac{1}{2^5}$

Question 3

Determine whether the series converges or diverges. If it converges, find the sum.

$$\sum_{n=2}^{\infty} \frac{1}{n-1}$$

1. 1

2. $\frac{1}{4}$

3. $\frac{1}{16}$

4. $\frac{1}{8}$

5. diverges

6. none of the above

Question 3

Determine whether the series converges or diverges. If it converges, find the sum.

$$\sum_{n=2}^{\infty} \frac{1}{n-1}$$

1. 1

2. $\frac{1}{4}$

3. $\frac{1}{16}$

4. $\frac{1}{8}$

5. diverges

6. none of the above

5. diverges

Solution

This is the harmonic series written differently: Writing out the first few terms,

$$\frac{1}{2-1} + \frac{1}{3-1} + \frac{1}{4-1} + \cdots$$

Question 4

Determine whether the series converges or diverges. If it converges, find the sum.

$$\sum_{n=1}^{\infty} \frac{2^n}{3n-1}$$

1. 1

2. $\frac{1}{2}$

3. 6

4. 2

5. diverges

6. none of the above

Question 4

Determine whether the series converges or diverges. If it converges, find the sum.

$$\sum_{n=1}^{\infty} \frac{2^n}{3n-1}$$

1. 1

2. $\frac{1}{2}$

3. 6

4. 2

5. diverges

6. none of the above

3. 6

Solution

This is a geometric series with $a = 2$ and $r = \frac{2}{3}$.