Precalc

Review Ch. 12

Whiteboards?

Quiz 12.7-12.8 Tues
Test Ch. 12 Wed.

Write each expression or complex number in exponential form.

41. $2\left(\cos\frac{3\pi}{4} + i\sin\frac{3\pi}{4}\right)$

$2\,\mathrm{cis}\,\frac{3\pi}{4}$

Find the first three iterates of the function $f(z) = 0.5z + (4 - 2i)$ for each initial value.

47. $z_0 = 4i$

48. $z_0 = -8$

Lesson 12-1 *(Pages 759–765)*

Find the next four terms in each arithmetic sequence.

1. 7, 3, −1, …

2. 0.5, −1, −2.5, …

4. 3, 2.8, 2.6, …

5. $4x, -x, -6x, \ldots$ $-11x, -16x, -21x, -26x$

$d = -5x$

For Exercises 7–13, assume that each sequence or series is arithmetic.

7. Find the 16th term in the sequence for which $a_1 = 2$ and $d = 5$.

$$a_{16} = a_1 + 15d$$
$$= 2 + 15 \cdot 5$$
$$= 2 + 25$$
$$= 27$$

8. Find n for the sequence for which $a_n = -20$, $a_1 = 6$ and $d = -2$.

10. Find d for the sequence in which $a_1 = 7$ and $a_{13} = 30$.

Lesson 12-2 *(Pages 766–773)*

Determine the common ratio and find the next three terms

1. 14, 7, 3.5, …

2. $-2, 4, -8, \ldots$

4. 10, −5, 2.5, …

5. $8, 8\sqrt{2}, 16, \ldots$ $16\sqrt{2}, 32, 32\sqrt{2}$

$r = \sqrt{2}$ $\frac{4}{-2} = -2$

8. If $r = 4$ and $a_8 = 100$, what is the first term of the sequence?

$$a_8 = a_1 r^7$$

$$100 = a_1 \cdot 4^7$$

$$\frac{100}{16{,}384} = 16{,}384\, a_1$$

$$= \cancel{0.00006} \quad 0.0061$$

10. Write a sequence that has two geometric means between 4 and 256.

4 16 64 256

$256 = 4r^3$

$64 = r^3$

$4 = r$

12 36 108

4 12 36 108 1024

$64 = r^4$

$\pm 3 = r$

$S_6 =$

11. What is the sum of the first six terms of the series $3 + 9 + 27 + \cdots$?

$=$

Lesson 12-3 *(Pages 774–783)*

Find each limit, or state that the limit does not exist and explain

1. $\lim_{n\to\infty} \frac{4 + 2n}{3n}$

2. $\lim_{n\to\infty} \frac{n^4 - 3n}{n^3}$

$\frac{\frac{4}{n} + \frac{2n}{n}}{\frac{3n}{n}}$ $\frac{2}{3}$

$\frac{n^4}{}$

Write each repeating decimal as a fraction.

7. $0.\overline{09}$

8. $0.1\overline{3}$

$0.1333333\ldots$

$0.1 + \frac{1}{10} + \frac{1}{30} = \frac{2}{15}$

$0.033333\ldots$

$a_1 = 0.03 \quad r = \frac{1}{10}$

$$S_n = \frac{a_1}{1-r} = \frac{0.03}{1-0.1} = \frac{0.03}{0.9} = \frac{3}{90} = \frac{1}{30}$$

Find the sum of the series, or state that the sum does not exist and explain

10. $\frac{1}{20} + \frac{1}{40} + \frac{1}{80} + \cdots$

11. $\frac{2}{7} + \frac{4}{7} + \frac{8}{7} + \cdots$

$\sum_{n=1}^{\infty} \frac{2^n}{7}$

DNA

/r/ <1

Lesson 12-4 *(Pages 786–793)*

Use the ratio test to determine whether each series is *convergent* or *divergent*.

1. $1^2 + 2^2 + 4^2 + 8^2 + \cdots$

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

$1\ 2\ 3\ 4 \ldots\ n$

$2^2\ 2^3$

$(2^{n-1})^2$

$\frac{n}{3}\quad\frac{n+1}{3}$

$\frac{(2^n)^2}{(2^{n-1})^2} = \frac{2^{n^2}}{2}\ (2^n)^2$

$(2^{n-1})(2^{n-1})$

$(2^{n+1-1})^2 = \frac{n+1}{n}$

$\frac{\frac{n}{n}+\frac{1}{n}}{\frac{n}{n}}$

$\frac{1+0}{1} = 1$

Will give comparison test samples

1 2 3 4 $\quad \frac{n}{1}$

Use the comparison test to determine whether each series is *convergent* or *dive*

5. $\frac{7}{7} + \frac{7}{13} + \frac{7}{19} + \frac{7}{25} + \cdots$

6. $\frac{1}{2^2} + \frac{1}{4^2} + \frac{1}{6^2} + \frac{1}{8^2} + \cdots$ $\quad \frac{1}{(2n)^2}$

$\frac{1}{n^2}$ $\quad \frac{1}{(2n)^2}$

$\frac{1}{2^2}$ $\frac{1}{4}$ $\quad \frac{1}{(2\cdot 2)^2}$ $\frac{1}{16}$

Write each expression in expanded form and then find the sum.

31. $\sum_{a=5}^{9} (3a - 3)$

32. $\sum_{k=1}^{\infty} (0.4)^k$

0.4^n

$a_1 = 0.4$

$r = 0.4$

1	2	3	4	
0.4^1	0.4^2	0.4^3	0.4^4	...
0.4	0.16	0.064		

$\frac{0.4}{1-0.4}$: $\frac{0.4}{0.6} = \frac{4}{6} = \frac{2}{3}$

Express each series using sigma notation

33. $-1 + 1 + 3 + 5 + \cdots$

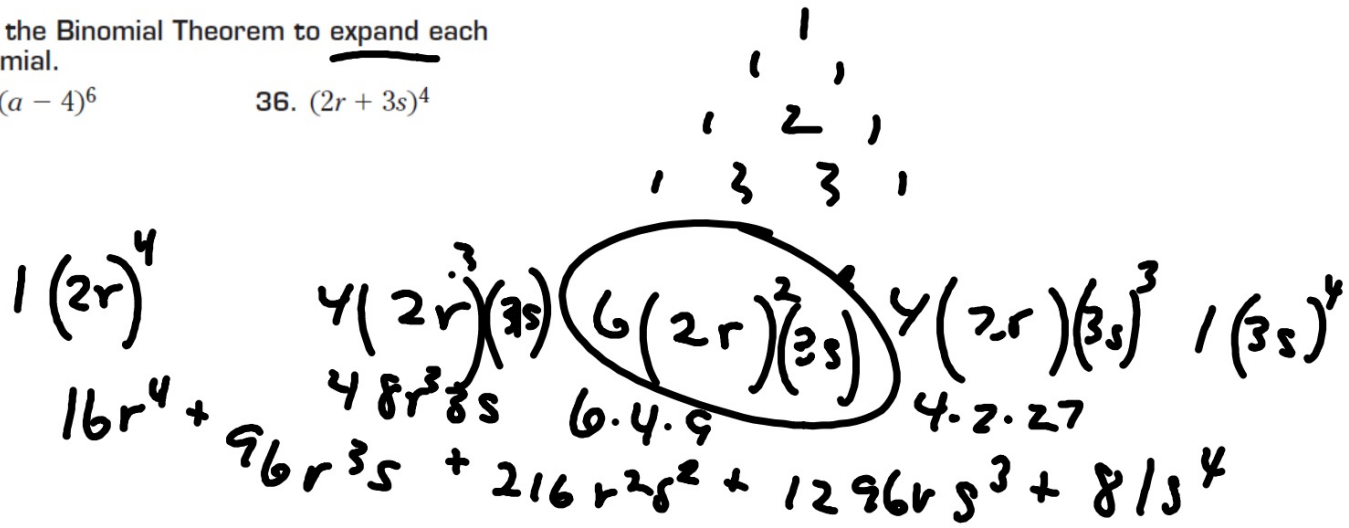
34. $2 + 5 + 10 + 17 + \cdots + 82$

$$\sum_{n=1}^{9} n^2 + 1$$

Use the Binomial Theorem to expand each binomial.

35. $(a - 4)^6$

36. $(2r + 3s)^4$



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