

HW27: Unit 3 Test Review

Simplify. Your answer should only contain positive exponents with no fractional exponents in the denominator.

1. $\frac{\sqrt[4]{112x^{10}}}{\sqrt[4]{7x}}$	2. $\left(\frac{3x^3y^2}{x^4}\right)^{-3}$	3. $\left(\frac{12x^{-3}y^{-3}z^3}{3xy^{-3}z^{-3}}\right)^{-1}$
4. $(-8)^{-\frac{4}{3}}$	5. $(27p^6)^{\frac{5}{3}}$	6. $(216r^9)^{\frac{1}{3}}$
7. $2m^2 \cdot 4m^{\frac{3}{2}} \cdot 4m^{-2}$	8. $3b^{\frac{1}{2}} \cdot b^{\frac{4}{3}}$	9. $\left(3y^{\frac{1}{3}}\right)\left(5y^{\frac{1}{4}}\right)$
10. $\frac{2x^{-\frac{1}{4}}}{4x^{\frac{2}{3}}}$	11. $\frac{4x^2}{2x^{\frac{1}{2}}}$	12. $\left(5^{\frac{1}{5}}\right)\left(25^{\frac{1}{5}}\right)$

Solve. Show all work.

13. $7^{\frac{x-2}{6}} = \sqrt{7}$	14. $8^{x+3} = 16^{x-1}$
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15. $64^x = \frac{1}{\sqrt{4}}$	16. $2^{-x+1} = 1$
17. $\left(\frac{1}{4}\right)^x = 32^{2x-3}$	18. $3^{-2x+1} \bullet 9^{-x-4} = 27$
19. $16^x \bullet \left(\frac{1}{64}\right)^{x+1} = 64$	20. $2^{2x+2} - 2^{3x} = 0$

State whether the sequence is arithmetic, geometric or neither.

21. 6, 24, 96, 384, ...	22. $\sum_{x=5}^{10} (x^2 - 1)$
23. $\sum_{i=1}^{20} 5i$	24. $-\frac{1}{4}, \frac{1}{8}, -\frac{1}{16}, \frac{1}{32}, \dots$
25. Write a formula for the general term (the nth term) of the arithmetic sequence. $a_{10} = -3, a_{19} = 24$	

26. Find a_9 of the geometric sequence $5, -1, \frac{1}{5}, -\frac{1}{25}, \dots$

27. Find a_{20} of the arithmetic sequence with $a_1 = -12$ and $d = 9$

28. Find the sum of the first 20 terms of the arithmetic sequence $4, 7, 10, 13, \dots$

29. Find the sum of the first 10 terms of the geometric sequence $6, -12, 24, -48, \dots$

Find the indicated sum.

30.
$$\sum_{k=3}^8 3(2)^{k-1}$$

31.
$$\sum_{n=2}^8 3n+1$$

32. Find the sum of the infinite geometric series.

$$3 - 1 + \frac{1}{3} - \frac{1}{9} + \dots$$

33. Edgar is getting better at math. On his first quiz he scored 57 points, then he scores 61 and 65 on his next two quizzes. If his scores continued to increase at the same rate, what will be his score on his 9th quiz? Show all work.

34. An auditorium has 20 seats on the first row, 24 seats on the second row, 28 seats on the third row, and so on and has 30 rows of seats. How many seats are in the theatre?

1. $2x^2\sqrt[4]{x}$

2. $\frac{x^3}{27y^6}$

3. $\frac{x^4}{4z^6}$

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

5. $243p^{10}$

6. $6r^3$

7. $32m^{\frac{3}{2}}$

8. $3b^{\frac{11}{6}}$

9. $15y^{\frac{7}{12}}$

10. $\frac{x^{\frac{1}{12}}}{2x}$ or $\frac{\sqrt[12]{x}}{2x}$

11. $2x^{\frac{3}{2}}$

12. $5^{\frac{3}{5}}$

13. $x = 5$

14. $x = 13$

15. $x = -\frac{1}{6}$

16. $x = 1$

17. $x = \frac{5}{4}$

18. $x = -\frac{5}{2}$

19. $x = -6$

20. $x = 2$

21. geometric

22. neither

23. arithmetic

24. geometric

25. $a_n = 3n - 33$

26. $\frac{1}{78125}$

27. 159

28. 650

29. -2046

30. 756

31. 112

32. $\frac{9}{4}$

33. 89 points

34. 2340 seats