Algebra 2 - Semester 2 Final Review (Ch. 5-9)

Short Answer

Use the properties of rational exponents to simplify the expression.

1. $\dfrac{16^{2/5} \cdot 8^{2/5}}{4^{2/5}}$

Use the properties of radicals to simplify the expression.

2. $\dfrac{\sqrt[4]{2304}}{\sqrt[4]{9}}$

Write the expression in simplest form.

3. $\dfrac{\sqrt[3]{4}}{\sqrt[3]{5}}$

4. $\dfrac{8}{6+\sqrt{7}}$

Simplify the expression.

5. $19\left(2^{1/3}\right) - 6\left(2^{1/3}\right)$

Write the expression in simplest form. Assume all variables are positive.

6. $\sqrt[6]{64r^{25}s^{18}t^{17}}$

Perform the indicated operation. Assume all variables are positive.

7. $11\sqrt[4]{n} - 6\sqrt[4]{n}$

Write a rule for g described by the transformations of the graph of f.

8. Let g be a vertical stretch by a factor of 5, followed by a translation 4 units up of the graph of $f(x) = \sqrt{x} - 1$.

Solve the equation. Check your solution(s).

9. $\sqrt{-3x+55} = x - 5$

Find the inverse of the function. Then graph the function and its inverse.

10. $f(x) = \frac{1}{5}x + 1$

Simplify the expression.

11. $(6e^{-5x})^2$

Rewrite the equation in logarithmic form.

12. $5^{-2} = \frac{1}{25}$

13. Simplify $e^{\ln 14}$.

14. $y = \ln(x - 2)$

15. Use $\log_7 8 \approx 1.069$ and $\log_7 5 \approx 0.827$ to evaluate $\log_7 \frac{8}{5}$.

Expand the logarithmic expression.

16. $\log_6 \sqrt[4]{7x}$

Condense the logarithmic expression.

17. $\log_7 2 + 2\log_7 6 - \log_7 9$

Solve the equation.

18. $16^x = \left(\frac{1}{4}\right)^{x+3}$

19. $\log_4 2x + \log_4 (x - 2) = 2$

Write the first six terms of the sequence.

20. $a_n = \frac{4n}{n+5}$

Describe the pattern, write the next term, and write a rule for the *n*th term of the sequence.

21. –15, –24, –33, –42,...

Find the sum.

22. $\displaystyle\sum_{i=1}^{4} -3(2)^{i-1}$

23. Write a rule for the nth term of the sequence. Then find a_{13}. $-6, -4, -2, 0, \dots$

Write a rule for the nth term of the arithmetic sequence.

24. $a_{16} = 66, a_{19} = 81$

25. Write a rule for the nth term of the sequence. Find a_6. 8, -32, 128, -512

Write a rule for the nth term of the geometric sequence.

26. $a_2 = 12, a_5 = 96$

Simplify.

27. $\dfrac{x^2 - 13x + 40}{x^2 - 10x + 25}$

28. $\dfrac{7x^4 - 9x^3}{12x^4}$

29. Graph $g(x) = \dfrac{2}{1+x} - 1$. State the domain and range.

Find the product.

30. $\dfrac{x+9}{x^2 + 7x - 18} \bullet \left(x^2 + 5x - 14 \right)$

31. $\dfrac{x^5(x+10)}{(x+5)} \bullet \dfrac{(x+5)(x-6)}{7x^6}$

Find the quotient.

32. $\dfrac{-10x}{x^2 - 11x + 28} \div \dfrac{90x - 10x^2}{x^2 - 16x + 63}$

Find the sum or difference.

33. $\dfrac{x+2}{2x+10} - \dfrac{-2x+8}{x^2 + x - 20}$

34. $\dfrac{18}{13x^2+4}+\dfrac{26}{13x^2+4}$

Solve the equation.

35. $\dfrac{2}{2+x}=\dfrac{9}{5x+7}$

36. $1-\dfrac{4}{x+9}=\dfrac{7}{x}$

37. Identify the period of $g(x)=\cos 5x$. Then graph the function and describe the graph of g as a transformation of the graph of $f(x)=\cos x$.
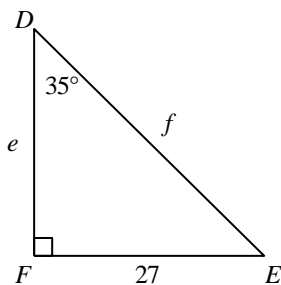
38. In a right triangle, θ is an acute angle and $\tan\theta=\dfrac{5}{4}$. Evaluate $\cos\theta$ and $\sin\theta$.

39. Draw an angle that measures $-280°$ in standard position.

40. Let $(-4,3)$ be a point on the terminal side of an angle θ in standard position. Evaluate sine, cosine and tangent of θ.

41. Convert $-\dfrac{7\pi}{10}$ to degrees.

42. Solve $\triangle DEF$.

43. Find the reference angle θ' for $\theta=329°$.

44. Graph $g(x)=4\sin 3x+3$.

45. Convert $35°$ to radians