Algebra II w/ Trigonometry
3.1-3.3 Quiz Review Sheet

Name Key

WITHOUT A CALCULATOR

1. Rewrite the expression using rational exponent notation. $\left(\sqrt[4]{x}\right)^3$ $x^{\frac{3}{4}}$	2. Rewrite the expression using rational exponent notation. $\left(\sqrt[9]{x}\right)^5$ $x^{\frac{5}{9}}$	3. Rewrite the expression using radical notation. $6^{\frac{3}{5}}$ $\left(\sqrt[5]{6}\right)^3$	4. Rewrite the expression using radical notation. $-27^{\frac{2}{3}}$ $-\left(\sqrt[3]{27}\right)^2$

Simplify: Do not leave any negative exponents.

5. $\sqrt[3]{-512}$ -8	6. $729^{\frac{2}{3}}$ $\left(\sqrt[3]{729}\right)^2$ $9^2 = 81$	7. $-27^{\frac{2}{3}}$ $-\left(\sqrt[3]{27}\right)^2$ $-(3^2) = -9$
8. $(16)^{\frac{-3}{2}}$ $\frac{1}{\left(\sqrt{16}\right)^3} = \frac{1}{4^3} = \frac{1}{64}$	9. $(8)^{\frac{5}{3}}$ $\left(\sqrt[3]{8}\right)^5$ $2^5 = 32$	10. $(25)^{-\frac{3}{2}}$ $\frac{1}{\left(\sqrt{25}\right)^3} = \frac{1}{5^3} = \frac{1}{125}$

WITH A CALCULATOR

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

11. $\sqrt[3]{81x^4y^{12}z^5}$ $\sqrt[3]{27}\sqrt[3]{3}\sqrt[3]{x^3}\sqrt[3]{x}\sqrt[3]{y^9}\sqrt[3]{y^3}\sqrt[3]{z^3}\sqrt[3]{z^2}$ $3xy^4z\sqrt[3]{3xz^2}$	12. $\sqrt[4]{625a^4b^8c^9}$ $5ab^2c^2\sqrt[4]{c}$	13. $x^{\frac{3}{4}} \cdot x^{\frac{1}{2}}$ $x^{\frac{3}{4}+\frac{1}{2}} = x^{\frac{5}{4}}$
14. $\sqrt[3]{432} - \sqrt[3]{54}$ $\sqrt[3]{216\cdot 2} - \sqrt[3]{27\cdot 2}$ $6\sqrt[3]{2} - 3\sqrt[3]{2} = 3\sqrt[3]{2}$	15. $x^{\frac{2}{7}} \cdot x^{\frac{5}{2}}$ $x^{\frac{2}{7}+\frac{5}{2}} = x^{\frac{39}{14}}$	16. $25\sqrt[5]{2} - 15\sqrt[5]{2}$ $10\sqrt[5]{2}$
17. $5\sqrt[4]{768} - 2\sqrt[4]{1875}$ $5\sqrt[4]{256\cdot 3} - 2\sqrt[4]{625\cdot 3}$ $5\cdot 4\sqrt[4]{3} - 2\cdot 5\sqrt[4]{3}$ $20\sqrt[4]{3} - 10\sqrt[4]{3} = 10\sqrt[4]{3}$	18. $\sqrt[4]{8}\cdot\sqrt[4]{324}$ $\sqrt[4]{2592} = \sqrt[4]{1296\cdot 2}$ $6\sqrt[4]{2}$	19. $\sqrt[3]{160}\cdot\sqrt[3]{2} = \sqrt[3]{320}$ $\sqrt[3]{64}\cdot\sqrt[3]{5}$ $4\sqrt[3]{5}$

Solve the equation. Round your answer to two decimal places.

20. $5x^2 = 15$

$\frac{5}{5} \quad \frac{15}{5}$

$\sqrt{x^2} = \sqrt{3}$

$x = \pm 1.73$

21. $-2x^3 = 50$

$\frac{-2}{-2} \quad \frac{50}{-2}$

$\sqrt[3]{x^3} = \sqrt[3]{-25}$

$x = -2.92$

22. $\sqrt[3]{(x+10)^3} = \sqrt[3]{-126}$

$x + 10 = -5.01$

$-10 \quad -10$

$x = -15.01$

23. $-7x^3 = 70$

$\frac{-7}{-7} \quad \frac{70}{-7}$

$\sqrt[3]{x^3} = \sqrt[3]{-10}$

$x = -2.15$

24. $\sqrt[7]{(x-4)^7} = \sqrt[7]{125}$

$x - 4 = 1.99$

$+4 \quad +4$

$x = 5.99$

25. $\sqrt[6]{x^6} = \sqrt[6]{113}$

$x = \pm 2.20$

26. $\sqrt[5]{(x-6)^5} = \sqrt[5]{111}$

$x - 6 = 2.56$

$+6 \quad +6$

$x = 8.56$

27. $x^{10} - 14 = 3323$

$+14 \quad +14$

$\sqrt[10]{x^{10}} = \sqrt[10]{3337}$

$x = \pm 2.25$

Perform the indicated operation. Let $f(x)=2x-3$ *and* $g(x)=4x$. Find the following:

28. $f(g(2))=$

$f(4\cdot 2)$

$f(8)$

$2(8)-3$

$16-3$

13

29. $g(f(-2))=$

$g(2(-2)-3)$

$g(-4-3)$

$g(-7)$

$4(-7)$

-28

30. $f(x)+g(x)$

$2x-3+4x$

$6x-3$

STATE THE DOMAIN:

$\mathbb{R}$

31. $g(x)-f(x)$

$(4x)-(2x-3)$

$4x-2x+3$

$2x+3$

STATE THE DOMAIN:

$\mathbb{R}$

32. $f(x)\bullet g(x)$

$(2x-3)(4x)$

$8x^2-12x$

STATE THE DOMAIN:

$\mathbb{R}$

33. $\frac{f(x)}{g(x)}$

$\frac{2x-3}{4x}$

STATE THE DOMAIN:

$x\neq 0$

Perform the indicated operation. Let $f(x)=4x^{\frac{1}{2}}$ *and* $g(x)=9x^{\frac{1}{2}}$. Find the following.

34. $f(g(81))=$

$f(9\cdot 81^{\frac{1}{2}})$

$f(9\cdot 9)$

$f(81)$

$4\cdot 81^{\frac{1}{2}}$

$4\cdot 9$

36

35. $g(f(36))=$

$g(4\cdot 36^{\frac{1}{2}})$

$g(4\cdot 6)$

$g(24)$

$9\cdot 24^{\frac{1}{2}}$

$9\cdot\sqrt{24}$

$9\cdot 2\sqrt{6}$

$18\sqrt{6}$

36. $f(x)+g(x)$

$4x^{\frac{1}{2}}+9x^{\frac{1}{2}}$

$13x^{\frac{1}{2}}$

STATE THE DOMAIN:

$x\geq 0$

37. $g(x)-f(x)$

$9x^{\frac{1}{2}}-4x^{\frac{1}{2}}$

$5x^{\frac{1}{2}}$

STATE THE DOMAIN:

$x\geq 0$

38. $f(x)\cdot g(x)$

$(4x^{\frac{1}{2}})(9x^{\frac{1}{2}})$

$36x$

STATE THE DOMAIN:

$x\geq 0$

39. $\frac{f(x)}{g(x)}$

$\frac{4x^{\frac{1}{2}}}{9x^{\frac{1}{2}}}$

$\frac{4}{9}$

STATE THE DOMAIN:

$x>0$