Algebra 2 CC Name_____ ID: 1

Radical Practice Worksheet

Date_____ Period____

Solve each equation. Remember to check for extraneous solutions.

1) $\sqrt{4n} = \sqrt{6 - 2n}$

2) $\sqrt{15 - 2x} = \sqrt{10 - x}$

3) $\sqrt{3x - 23} = 2$

4) $14 = \sqrt{\frac{a}{3}} + 9$

5) $\sqrt{2a - 6} = a - 3$

6) $\sqrt{3p - 20} = p - 6$

7) $b - 5 = \sqrt{6b - 35}$

8) $4 + \sqrt{15r + 1} = 8$

9) $-4 = \sqrt{\frac{m}{2}} - 5$

10) $\sqrt{-5 - 3a} - \sqrt{-3 - a} = 2$

11) $\sqrt{-5 - 6r} - \sqrt{-6 - 2r} = 3$

12) $\sqrt{2k + 10} = 3 - \sqrt{-2 - 9k}$

Simplify.

13) $5\sqrt{15}\left(\sqrt{10} + 2\sqrt{6}\right)$

14) $-4\sqrt{3}\left(4\sqrt{5} + \sqrt{6}\right)$

Write each expression in exponential form.

15) $\left(\sqrt{r}\right)^3$

16) $\left(\sqrt{5m}\right)^3$

17) $\left(\sqrt{3n}\right)^3$

18) $\left(\sqrt[4]{3x}\right)^3$

19) $\left(\sqrt[4]{3n}\right)^5$

20) $\left(\sqrt[6]{2b}\right)^7$

Simplify.

21) $\sqrt[3]{-54b^8}$

22) $\sqrt[3]{375b^4}$

23) $\sqrt{18m^3}$

24) $\sqrt{294r^2}$

25) $\sqrt{245n^3}$

26) $\sqrt{128b^4}$

27) $\frac{4\sqrt{5}}{4\sqrt{125}}$

28) $\frac{4\sqrt{20}}{2\sqrt{5}}$

29) $\frac{4\sqrt{4}}{\sqrt{100}} = \frac{4 \cdot 2}{10} : \frac{8}{10} : \frac{4}{5}$

30) $\frac{5\sqrt{3}}{\sqrt{4}}$

31) $\frac{4\sqrt{15}}{4\sqrt{3}}$

32) $\frac{4\sqrt{6}}{\sqrt{3}}$

33) $2\sqrt{2} + 2\sqrt{5} + 3\sqrt{2}$

34) $-3\sqrt{8} - \sqrt{20} + 3\sqrt{45}$

35) $2\sqrt{3} - 2\sqrt{3} + 3\sqrt{12}$

36) $-\sqrt{24} + 3\sqrt{54} - \sqrt{12}$

1) $\sqrt{4n} = \sqrt{6-2n}$

$(\sqrt{4n})^2 = (\sqrt{6-2n})^2$

$4n = 6 - 2n$

$+2n \quad +2n$

$6n = 6$

$\frac{6n}{6} = \frac{6}{6}$

$n = 1$

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2) $\left(\sqrt{15-2x}\right)^2 = \left(\sqrt{10-x}\right)^2$

$15 - 2x = 10 - x$

$+2x \qquad +2x$

$15 = 10 + x$

$5 = x$

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3) $\left(\sqrt{3x-23}\right)^2 = (2)^2$

$3x - 23 = 4$

$3x = 27$

$x = 9$

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4) $14 = \sqrt{\frac{a}{3}} + 9$

$-9 \quad -9$

$(5)^2 = \left(\sqrt{\frac{a}{3}}\right)^2$

$(3)25 = \frac{a}{3}(3)$

$75 = a$

$(5)^2 = \left(\sqrt{\frac{a}{3}} + 9\right)^2$

$196 = \left(\sqrt{\frac{a}{3}} + 9\right)\left(\sqrt{\frac{a}{3}} + 9\right)$

$196 = \frac{a}{3} + 18\sqrt{\frac{a}{3}} + 81$

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5) $(\sqrt{2a-6})^2 = (a-3)^2$

$2a-6 = (a-3)^2$

$2a-6 = (a-3)(a-3)$

$2a-6 = a^2-3a-3a+9$

$2a-6 = a^2-6a+9$

$-2a \qquad -2a$

$-6 = a^2-8a+9$

$+6 \qquad +6$

$0 = a^2-8a+15$

$3 \cdot 5 = +8$

$-3 \cdot -5 = -8$

$0 = (a-3)(a-5)$

$a-3=0 \qquad a-5=0$

$a=3 \qquad a=5$

10) $\left(\sqrt{-5-3a}-\sqrt{-3-a}\right)^2=(2)^2$

$\left(\sqrt{-5-3a}-\sqrt{-3-a}\right)\left(\sqrt{-5-3a}-\sqrt{-3-a}\right)$

$\left(\sqrt{-5-3a}\right)\left(\sqrt{-5-3a}\right)$

$-5-3a$

$+\left(\sqrt{-3-a}\right)\left(\sqrt{-3-a}\right)$

$-3-a$

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10) $\sqrt{-5-3a}-\sqrt{-3-a}=2$

$\left(\sqrt{-5-3a}-\sqrt{-3-a}\right)\left(\sqrt{-5-3a}-\sqrt{-3-a}\right)$

10) $\sqrt{-5-3a}-\sqrt{-3-a}=2$

$\{-3, -7\}$

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10) $\sqrt{-5-3a}-\sqrt{-3-a}=2$

$\left(\sqrt{-5-3a}-\sqrt{-3-a}\right)\left(\sqrt{-5-3a}-\sqrt{-3-a}\right)$

$-5-3a$ $\sqrt{-5-3a}\cdot\sqrt{-3-a}$ $-3a-a$

$\sqrt{-3-a}\cdot\sqrt{-5-3a}$

$2\sqrt{-5\cdot-3\cdot-3a\cdot-3a}$

$a\cdot3\cdot2\sqrt{15\cdot9\cdot a^2}$

$-5-3a+6a\sqrt{15}-3a-a$

1) $\left(\sqrt{4n}\right)^2 = \left(\sqrt{6-2n}\right)^2$

$4n = 6 - 2n$

$+2n \qquad +2n$

$\frac{6n}{6} = \frac{6}{6}$

$n = 1$

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2) $\left(\sqrt{15-2x}\right)^2 = \left(\sqrt{10-x}\right)^2$

$15-2x = 10-x$

$-10 \quad -10$

$5-2x = -x$

$+2x \quad +2x$

$5 = x$

Oct 30-9:22 AM

3) $\left(\sqrt{3x-23}\right)^2 = (2)^2$

$3x - 23 = 4$

$3x = 27$

$x = 9$

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4) $14 = \sqrt{\frac{a}{3}} + 9$

$-9 \quad -9$

$(5)^2 = \left(\sqrt{\frac{a}{3}}\right)^2$

$(3)25 = \frac{a}{3}(3)$

$75 = a$

Time Out !!

$(14)^2 = \left(\sqrt{\frac{a}{3}} + 9\right)^2$

$196 = \left(\sqrt{\frac{a}{3}} + 9\right)\left(\sqrt{\frac{a}{3}} + 9\right)$

$\frac{a}{3} + 9\sqrt{\frac{a}{3}} \quad 9\sqrt{\frac{a}{3}} + 81$

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5) $(\sqrt{2a-6})^2 = (a-3)^2$

$2a-6 = (a-3)(a-3)$

$2a-6 = a^2-6a+9$

$+6 \qquad +6$

$2a = a^2-6a+15$

$-2a \qquad -2a$

$0 = a^2-8a+15$

$0 = (a-5)(a-3)$ $\quad 1\cdot 15 \quad -1\cdot -15$ $\quad 5\cdot 3 \quad -5\cdot -3$

$a=5 \quad a=3$

GCF

FACTOR

$\frac{-b \pm \sqrt{b^2-4ac}}{2a}$

Oct 30-9:22 AM

1) $\sqrt{4n} = \sqrt{6-2n}$

$\frac{\sqrt{4n}}{\sqrt{4n}} \quad \frac{\sqrt{4n}}{\sqrt{4n}}$

$1 = \frac{\sqrt{6-2n}}{\sqrt{4n}}$

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17) $(\sqrt{3n})^3$

18) $(\sqrt[4]{3x})^3$

19) $(\sqrt[4]{3n})^5$

20) $(\sqrt[6]{2b})^7$

19)

$(\sqrt[4]{3n})(\sqrt[4]{3n})(\sqrt[4]{3n})(\sqrt[4]{3n})(\sqrt[4]{3n})$

$(\sqrt[4]{3n})^4$

$3n(\sqrt[4]{3n})$

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18) $(\sqrt[4]{3x})^3$

$(\sqrt[4]{3x})(\sqrt[4]{3x})(\sqrt[4]{3x})$

$(\sqrt[4]{3x})^3$ answer

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20) $(\sqrt[6]{2b})^7$

$(\sqrt[6]{2b})(\sqrt[6]{2b})(\sqrt[6]{2b})(\sqrt[6]{2b})(\sqrt[6]{2b})(\sqrt[6]{2b})(\sqrt[6]{2b})$

$(\sqrt[6]{2b})(\sqrt[6]{2b})(\sqrt[6]{2b})$

$2b(\sqrt[6]{2b})$

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Simplify:

21) $\sqrt[3]{+54b^8}$

$\sqrt[3]{+54} \cdot \sqrt[3]{b^8}$

$\sqrt[3]{b \cdot b \cdot b} \sqrt[3]{b \cdot b \cdot b} b \cdot b$

$\sqrt[3]{27} \cdot 2$

$b \cdot b \cdot \sqrt[3]{b^2}$

$\sqrt[3]{27} \cdot \sqrt[3]{2}$

$3\sqrt[3]{2} \cdot b \cdot b \cdot \sqrt[3]{b^2}$

$3b^2\sqrt[3]{2b^2}$

answer

1	$1^3 = 1$	$\sqrt[3]{1} = 1$
2	$2^3 = 8$	$\sqrt[3]{8} = 2$
3	$3^3 = 27$	$\sqrt[3]{27} = 3$
4	$4^3 = 64$	$\sqrt[3]{64} = 4$
5	$5^3 = 125$	$\sqrt[3]{125} = 5$
6	$6^3 = 216$	$\sqrt[3]{216} = 6$
7	$7^3 = 343$	$\sqrt[3]{343} = 7$

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17) $(\sqrt{3n})^3$

18) $(\sqrt[4]{3x})^3$ answer

19) $(\sqrt[4]{3n})^5$

20) $(\sqrt[6]{2b})^7$

17) $(\sqrt{3n})^3$

$(\sqrt{3n})(\sqrt{3n})(\sqrt{3n})$

$(\sqrt{3n})^2$

$3n\sqrt{3n}$ answer

19) $(\sqrt[4]{3n})^5$

$(\sqrt[4]{3n})(\sqrt[4]{3n})(\sqrt[4]{3n})(\sqrt[4]{3n})(\sqrt[4]{3n})$

$(\sqrt[4]{3n})^4(\sqrt[4]{3n})$

$3n(\sqrt[4]{3n})$

answer

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20) $(\sqrt[6]{2b})^7$

$(\sqrt[6]{2b})(\sqrt[6]{2b})(\sqrt[6]{2b})(\sqrt[6]{2b})(\sqrt[6]{2b})(\sqrt[6]{2b})(\sqrt[6]{2b})$

$(\sqrt[6]{2b})^6$

$= 2b(\sqrt[6]{2b})$

Oct 30-9:46 AM

1) $\left(\sqrt{4n}\right)^2 = \left(\sqrt{6-2n}\right)^2$

$4n = 6-2n$

$+2n \quad +2n$

$\frac{6n}{6} = \frac{6}{6}$

$n = 1$

2) $\left(\sqrt{15-2x}\right)^2 = \left(\sqrt{10-x}\right)^2$

$15-2x = 10-x$

$+2x \quad +2x$

$15 = 10+x$

$-10 \quad -10$

$5 = x$

3) $\left(\sqrt{3x-23}\right)^2 = (2)^2$

$3x - 23 = 4$

$+23 \quad +23$

$\frac{3x}{3} = \frac{27}{3}$

$x = 9$

4) $14 = \sqrt{\frac{a}{3}} + 9$

$-9 \quad -9$

$5^2 = \left(\sqrt{\frac{a}{3}}\right)^2$

$(3)25 = \left(\frac{a}{3}\right)3$

$75 = a$

what if...

$(14)^2 = \left(\sqrt{\frac{a}{3}} + 9\right)^2$

$\left(\sqrt{\frac{9}{3}} + 9\right)\left(\sqrt{\frac{a}{3}} + 9\right)$

5) $\sqrt{2a-6} = (a-3)^2$

$2a-6 = (a-3)^2$

$2a-6 = (a-3)(a-3)$

$2a-6 = a^2-6a+9$

$-2a \qquad -2a$

$-6 = a^2-8a+9$

$+6 \qquad +6$

$0 = a^2-8a+15$

$1 \cdot 15$
$3 \cdot 5$
$-1 \cdot -15$
$-3 \cdot -5$

$0 = (a-3)(a-5)$

$a=3 \quad a=5$

① FACTOR
② GCF
③ $\frac{-b \pm \sqrt{b^2-4ac}}{2a}$

6) $\sqrt{3p-20} = p-6$

Oct 30-8:27 AM

17) $(\sqrt[2]{3n})^3$ $(\sqrt{3n})^2(\sqrt{3n})$ $3n\ \sqrt{3n}$

18) $(\sqrt[4]{3x})^3$

19) $(\sqrt[4]{3n})^5$

20) $(\sqrt[6]{2b})^7$

Simplify.

21) $\sqrt[3]{-54b^8}$

22) $\sqrt[3]{375b^4}$

23) $\sqrt{18m^3}$

24) $\sqrt{294r^2}$

25) $\sqrt{245n^3}$

26) $\sqrt{128b^4}$

27) $\frac{4\sqrt{5}}{4\sqrt{125}}$

28) $\frac{4\sqrt{20}}{2\sqrt{5}}$

29) $\frac{4\sqrt{4}}{\sqrt{100}}$

30) $\frac{5\sqrt{3}}{\sqrt{4}}$

31) $\frac{4\sqrt{15}}{4\sqrt{3}}$

32) $\frac{4\sqrt{6}}{\sqrt{3}}$

33) $2\sqrt{2}+2\sqrt{5}+3\sqrt{2}$

34) $-3\sqrt{8}-\sqrt{20}+3\sqrt{45}$

35) $2\sqrt{3}-2\sqrt{3}+3\sqrt{12}$

36) $-\sqrt{24}+3\sqrt{54}-\sqrt{12}$

Simplify.

21) $\sqrt[3]{-54b^8}$

$i\sqrt[3]{54b^8}$

$\sqrt[3]{b^8}$

$3\sqrt[3]{3\cdot3\cdot3\cdot2}\; b\,b\sqrt[3]{b\,b\,b\,b\,b\,b\,b\,b}$

$\frac{54}{27}:2$

$3\cdot3\cdot3:27$

$(3)^3:27$

$3\sqrt[3]{(3)^3\cdot2}$ $\quad b^2\sqrt[3]{b^2}$

$3i\sqrt[3]{2}$ $\quad b^2\sqrt[3]{b^2}$

$3b^2i\sqrt[3]{2b^2}$

17) $(\sqrt[2]{3n})^3$ $3n\sqrt{3n}$

18) $(\sqrt[4]{3x})^3$

19) $(\sqrt[4]{3n})^5$

20) $(\sqrt[6]{2b})^7$ $2b\sqrt[6]{2b}$

$(\sqrt[4]{3n})^5$

$(\sqrt[4]{3n})^4 (\sqrt[4]{3n})^1$

$(\sqrt[4]{3n})(\sqrt[4]{3n})(\sqrt[4]{3n})(\sqrt[4]{3n})(\sqrt[4]{3n})$

$(\sqrt[4]{3n})^4 (\sqrt[4]{3n})$

$3n\sqrt[4]{3n}$ answer

$(\sqrt[2]{3n})^2 = 3n$

$(\sqrt[3]{3n})^3 = 3n$

$(\sqrt[4]{3n})^4 = 3n$

Algebra 2 CC Name_____ ID: 1

Radical Practice Worksheet

Date_____ Period____

Solve each equation. Remember to check for extraneous solutions.

1) $\sqrt{4n} = \sqrt{6 - 2n}$

{1}

2) $\sqrt{15 - 2x} = \sqrt{10 - x}$

{5}

3) $\sqrt{3x - 23} = 2$

{9}

4) $14 = \sqrt{\frac{a}{3}} + 9$

{75}

5) $\sqrt{2a - 6} = a - 3$

{3, 5}

6) $\sqrt{3p - 20} = p - 6$

{7, 8}

7) $b - 5 = \sqrt{6b - 35}$

{6, 10}

8) $4 + \sqrt{15r + 1} = 8$

{1}

9) $-4 = \sqrt{\frac{m}{2}} - 5$

{2}

10) $\sqrt{-5 - 3a} - \sqrt{-3 - a} = 2$

{−3, −7}

11) $\sqrt{-5 - 6r} - \sqrt{-6 - 2r} = 3$

$\left\{-\frac{7}{2}, -5\right\}$

12) $\sqrt{2k + 10} = 3 - \sqrt{-2 - 9k}$

No solution.

Simplify.

13) $5\sqrt{15}\left(\sqrt{10} + 2\sqrt{6}\right)$

$25\sqrt{6} + 30\sqrt{10}$

14) $-4\sqrt{3}\left(4\sqrt{5} + \sqrt{6}\right)$

$-16\sqrt{15} - 12\sqrt{2}$

Write each expression in exponential form.

15) $\left(\sqrt{r}\right)^3$

$r^{\frac{3}{2}}$

16) $\left(\sqrt{5m}\right)^3$

$(5m)^{\frac{3}{2}}$

17) $(\sqrt{3n})^3$

$(3n)^{\frac{3}{2}}$

18) $(\sqrt[4]{3x})^3$

$(3x)^{\frac{3}{4}}$

19) $(\sqrt[4]{3n})^5$

$(3n)^{\frac{5}{4}}$

20) $(\sqrt[6]{2b})^7$

$(2b)^{\frac{7}{6}}$

Simplify.

21) $\sqrt[3]{-54b^8}$

$-3b^2\sqrt[3]{2b^2}$

22) $\sqrt[3]{375b^4}$

$5b\sqrt[3]{3b}$

23) $\sqrt{18m^3}$

$3m\sqrt{2m}$

24) $\sqrt{294r^2}$

$7r\sqrt{6}$

25) $\sqrt{245n^3}$

$7n\sqrt{5n}$

26) $\sqrt{128b^4}$

$8b^2\sqrt{2}$

27) $\dfrac{4\sqrt{5}}{4\sqrt{125}}$

$\dfrac{1}{5}$

28) $\dfrac{4\sqrt{20}}{2\sqrt{5}}$

4

29) $\dfrac{4\sqrt{4}}{\sqrt{100}}$

$\dfrac{4}{5}$

30) $\dfrac{5\sqrt{3}}{\sqrt{4}}$

$\dfrac{5\sqrt{3}}{2}$

31) $\dfrac{4\sqrt{15}}{4\sqrt{3}}$

$\sqrt{5}$

32) $\dfrac{4\sqrt{6}}{\sqrt{3}}$

$4\sqrt{2}$

33) $2\sqrt{2}+2\sqrt{5}+3\sqrt{2}$

$5\sqrt{2}+2\sqrt{5}$

34) $-3\sqrt{8}-\sqrt{20}+3\sqrt{45}$

$-6\sqrt{2}+7\sqrt{5}$

35) $2\sqrt{3}-2\sqrt{3}+3\sqrt{12}$

$6\sqrt{3}$

36) $-\sqrt{24}+3\sqrt{54}-\sqrt{12}$

$7\sqrt{6}-2\sqrt{3}$