

Review 5.1-5.4

Simplify. Use absolute value signs when necessary.

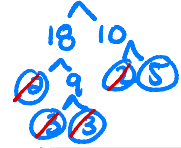
1) $\sqrt[3]{1000m^4p^2q^2} = 10m\sqrt[3]{mp^2q^2}$

2) $\sqrt{98x^4y^2} = 7x^2|y|\sqrt{2}$



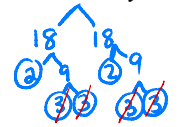
3) $\sqrt{144n^2} = 12|n|$

4) $\sqrt{180} = 3 \cdot 2 \sqrt{5} = 6\sqrt{5}$



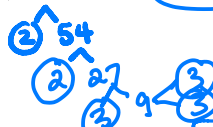
5) $\sqrt[3]{162m^3} = 3m\sqrt[3]{6}$

6) $\sqrt[4]{324x^8y^4z^5} = 3x^2|y||z|\sqrt[4]{4z}$



7) $\sqrt[5]{-160x^7} = -2x\sqrt[5]{5x^2}$

8) $\sqrt{108} = 6\sqrt{3}$



9) $\sqrt[4]{96} = 2\sqrt[4]{6}$

10) $\sqrt[3]{-48a^3b^4} = -2ab\sqrt[3]{6b}$



Write each expression in exponential form.

11) $(\sqrt{k})^3 = k^{\frac{3}{2}}$

12) $(\sqrt[5]{x})^7 = x^{\frac{7}{5}}$

13) $(\sqrt[5]{3x})^3 = (3x)^{\frac{3}{5}}$

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

Write each expression in radical form. Simplify when necessary.

15) $v^{\frac{1}{6}} = \sqrt[6]{v}$

16) $(2p)^{\frac{5}{2}} = \sqrt{2^5p^5} = 2^2p^2\sqrt{2p} = 4p^2\sqrt{2p}$

17) $(2p)^{\frac{3}{2}} = \sqrt{2^3p^3} = 2|p|\sqrt{2p}$

18) $n^{\frac{1}{4}} = \sqrt[4]{n}$

Solve.

~~6~~
2/5/3

19) $4n^2 + 10n + 6 = 0$
 $2n^2 + 5n + 3 = 0$
 $(2n+3)(n+1) = 0$
 $2n+3=0 \quad n+1=0$
 $n = -\frac{3}{2} \quad n = -1$

$\left\{-\frac{3}{2}, -1\right\}$

20) $7m^2 - 4m + 2 = 0$
 $a=7 \quad b=-4 \quad c=2$

$\left\{\frac{2-i\sqrt{10}}{7}, \frac{2+i\sqrt{10}}{7}\right\}$

$x = 4 \pm \sqrt{16 - 4(7)(2)}$

$x = \frac{4 \pm \sqrt{-40}}{14} = \frac{4 \pm 2i\sqrt{10}}{14} = \frac{2 \pm i\sqrt{10}}{7}$

21) $8r^2 + 2r + 2 = 0$

$4r^2 + r + 1 = 0$
 $a=4 \quad b=1 \quad c=1$

$x = \frac{-1 \pm \sqrt{1 - 4(4)(1)}}{8}$

$\left\{\frac{-1+i\sqrt{15}}{8}, \frac{-1-i\sqrt{15}}{8}\right\}$

$x = \frac{-1 \pm \sqrt{-15}}{8} = \frac{-1 \pm i\sqrt{15}}{8}$

22) $3v^2 + 9 = 0$

$3v^2 = -9$

$\sqrt{v^2} = \sqrt{-3}$

$v = \pm i\sqrt{3}$

$\{-i\sqrt{3}, i\sqrt{3}\}$

23) $b^2 - 4b = -1$

$b^2 - 4b + 4 = -1 + 4$

$\sqrt{(b-2)^2} = \sqrt{3}$

$b-2 = \pm\sqrt{3}$

$\{2-\sqrt{3}, 2+\sqrt{3}\}$

$b = 2 \pm \sqrt{3}$

24) $\frac{2n^2}{2} - \frac{120}{2} = \frac{-8n}{2}$

$n^2 - 60 = -4n$

$n^2 + 4n - 60 = 0$

$(n+10)(n-6) = 0$

$n+10=0 \quad n-6=0$

$n = -10 \quad n = 6$

$\{-10, 6\}$

25) $\frac{2m^2}{2} = \frac{24}{2}$

$\sqrt{m^2} = \sqrt{12} < \textcircled{4}$
 $\textcircled{2}$

$m = \pm 2\sqrt{3}$

$\{-2\sqrt{3}, 2\sqrt{3}\}$

26) $\frac{2m^2}{2} - 11m + 4 = \frac{-2m^2}{2}$

$4m^2 - 11m + 4 = 0$

$x = \frac{11 \pm \sqrt{121 - 4(4)(4)}}{8}$

$\left\{\frac{11-\sqrt{57}}{8}, \frac{11+\sqrt{57}}{8}\right\}$

$x = \frac{11 \pm \sqrt{57}}{8}$

27) $7x^2 - 15x = -2 - 12x$

$+12x \quad +2 \quad +12x$

$7x^2 - 3x + 2 = 0$

$x = \frac{3 \pm \sqrt{9 - 4(7)(2)}}{14}$

$\left\{\frac{3+i\sqrt{47}}{14}, \frac{3-i\sqrt{47}}{14}\right\}$

$x = \frac{3 \pm \sqrt{-47}}{14} = \frac{3 \pm i\sqrt{47}}{14}$

28) $20m^2 + 6m + 4 = -6 + 11m^2$

$-11m^2 \quad +6 \quad +6 \quad -11m^2$

$9m^2 + 6m + 10 = 0$

$m = \frac{-6 \pm \sqrt{36 - 4(9)(10)}}{18} = \frac{-6 \pm \sqrt{-324}}{18}$

$= \frac{-6 \pm 18i}{18} \left\{\frac{-1+3i}{3}, \frac{-1-3i}{3}\right\}$

$= \frac{-1 \pm 3i}{3}$

29) $4x^2 - 9 = 40$

$+9 \quad +9$

$4x^2 = 49$

$\sqrt{x^2} = \sqrt{\frac{49}{4}}$

$x = \pm \frac{7}{2}$

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

30) $7 - 9k^2 = -2$

$-7 \quad -7$

$-9k^2 = -9$

$\sqrt{k^2} = \sqrt{1}$

$k = \pm 1$

$\{-1, 1\}$

31) $v^2 + 49 = 14v$

$v^2 - 14v + 49 = 0$

$(v-7)(v-7) = 0$

$v-7=0 \quad v-7=0$

$v=7 \quad v=7$

$\{7\}$

32) $\frac{7x^2}{7} + \frac{49x}{7} = \frac{-42}{7}$

$x^2 + 7x = -6$

$x^2 + 7x + 6 = 0$

$(x+6)(x+1) = 0$

$x+6=0 \quad x+1=0$
 $x=-6 \quad x=-1$

$\{-6, -1\}$

No linear term. I use square root method.

Review 5.1-5.4

Simplify. Use absolute value signs when necessary.

1) $\sqrt[3]{1000m^4p^2q^2}$
 $10m\sqrt[3]{mp^2q^2}$

2) $\sqrt{98x^4y^2}$
 $7x^2|y|\sqrt{2}$

3) $\sqrt{144n^2}$
 $12|n|$

4) $\sqrt{180}$
 $6\sqrt{5}$

5) $\sqrt[3]{162m^3}$
 $3m\sqrt[3]{6}$

6) $\sqrt[4]{324x^8y^4z^5}$
 $3x^2|y| \cdot |z|\sqrt[4]{4z}$

7) $\sqrt[5]{-160x^7}$
 $-2x\sqrt[5]{5x^2}$

8) $\sqrt{108}$
 $6\sqrt{3}$

9) $\sqrt[4]{96}$
 $2\sqrt[4]{6}$

10) $\sqrt[3]{-48a^3b^4}$
 $-2ab\sqrt[3]{6b}$

Write each expression in exponential form.

11) $(\sqrt{k})^3$
 $k^{\frac{3}{2}}$

12) $(\sqrt[5]{x})^7$
 $x^{\frac{7}{5}}$

13) $(\sqrt[5]{3x})^3$
 $(3x)^{\frac{3}{5}}$

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

Write each expression in radical form. Simplify when necessary.

15) $v^{\frac{1}{6}}$
 $\sqrt[6]{v}$

16) $(2p)^{\frac{5}{2}}$
 $(\sqrt{2p})^5$

17) $(2p)^{\frac{3}{2}}$
 $(\sqrt{2p})^3$

18) $n^{\frac{1}{4}}$
 $\sqrt[4]{n}$

Solve.

19) $4n^2 + 10n + 6 = 0$

$$\left\{-1, -\frac{3}{2}\right\}$$

20) $7m^2 - 4m + 2 = 0$

$$\left\{\frac{2 + i\sqrt{10}}{7}, \frac{2 - i\sqrt{10}}{7}\right\}$$

21) $8r^2 + 2r + 2 = 0$

$$\left\{\frac{-1 + i\sqrt{15}}{8}, \frac{-1 - i\sqrt{15}}{8}\right\}$$

22) $3v^2 + 9 = 0$

$$\{i\sqrt{3}, -i\sqrt{3}\}$$

23) $b^2 - 4b = -1$

$$\{2 + \sqrt{3}, 2 - \sqrt{3}\}$$

24) $2n^2 - 120 = -8n$

$$\{6, -10\}$$

25) $2m^2 = 24$

$$\{2\sqrt{3}, -2\sqrt{3}\}$$

26) $2m^2 - 11m + 4 = -2m^2$

$$\left\{\frac{11 + \sqrt{57}}{8}, \frac{11 - \sqrt{57}}{8}\right\}$$

27) $7x^2 - 15x = -2 - 12x$

$$\left\{\frac{3 + i\sqrt{47}}{14}, \frac{3 - i\sqrt{47}}{14}\right\}$$

28) $20m^2 + 6m + 4 = -6 + 11m^2$

$$\left\{\frac{-1 + 3i}{3}, \frac{-1 - 3i}{3}\right\}$$

29) $4x^2 - 9 = 40$

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

30) $7 - 9k^2 = -2$

$$\{1, -1\}$$

31) $v^2 + 49 = 14v$

$$\{7\}$$

32) $7x^2 + 49x = -42$

$$\{-6, -1\}$$