

Algebra 2 CC

Name _____ ID: 1

Radical Practice Worksheet

Date _____ Period _____

Solve each equation. Remember to check for extraneous solutions.

1) $(\sqrt{3-k})^2 = (\sqrt{-4-2k})^2$

2) $\sqrt{2a-25} = \sqrt{a-9}$

$$\begin{array}{r} 3-k = -4-2k \\ +2k \quad +2k \\ \hline 3+k = -4 \end{array}$$

$$3+k = -4$$

$$k = -7$$

check

$$\sqrt{3-(-7)} = \sqrt{-4-2(-7)}$$

$$\sqrt{10} = \sqrt{10}$$

3) $(x-4)^2 = (2x+7)^2$

4) $9 = (\sqrt{x+8})^2$

$$(x-4)^2 = 2x+7$$

$$81 = x+8$$

$$(x-4)(x-4) = 2x+7$$

$$73 = x$$

$$x^2 - 4x - 4 + 16 = 2x + 7$$

$$\begin{array}{r} x^2 - 8x + 16 = 2x + 7 \\ -2x \quad -2x \\ \hline x^2 - 10x + 16 = 7 \end{array}$$

$$x^2 - 10x + 9 = 0$$

$$x^2 - 10x + 9 = 0$$

GCF
FACTOR
 $-b \pm \sqrt{b^2 - 4ac}$
25

1.9
3.3
-1.-9
-3.-3

$$(x-1)(x-9) = 0$$

~~x=1~~ x=9

-1-

$$\begin{array}{l} x-4 = \sqrt{2x+7} \\ (1)-4 = \sqrt{2(1)+7} \end{array}$$

$$x-4 = \sqrt{2x+7}$$

$$(-3) = \sqrt{2+7}$$

$$9-4 = \sqrt{2(9)+7}$$

$$\begin{array}{l} -3 = \sqrt{10} \\ \text{Not true} \end{array}$$

$$5 = \sqrt{18+7}$$

$$\begin{array}{l} 5 = \sqrt{25} \\ 5 = 5 \checkmark \end{array}$$

$$5) \begin{array}{r} 4 + \sqrt{n-3} = 13 \\ -4 \quad -4 \\ \hline \end{array}$$

$$(\sqrt{n-3})^2 = (9)^2$$

$$n-3 = 81$$

$$n = 84$$

check

$$4 + \sqrt{84-3} = 13$$

$$4 + \sqrt{81} = 13$$

$$4 + 9 = 13 \quad \checkmark$$

Simplify

$$7) 5\sqrt{15}(\sqrt{10} + 2\sqrt{6})$$

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

$$5\sqrt{150} + 10\sqrt{90}$$

$$5\sqrt{25 \cdot 6} + 10\sqrt{9 \cdot 10}$$

$$5 \cdot 5\sqrt{6} + 10 \cdot 3\sqrt{10}$$

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

$$6) (\sqrt{3x+2}) = (\sqrt{4-8x})^2$$

$$(\sqrt{3x+2})(\sqrt{3x+2}) = 4-8x$$

$$(\sqrt{3x})(\sqrt{3x}) + 2\sqrt{3x} + 2\sqrt{3x} + 4 = 4-8x$$

$$3x + 4\sqrt{3x} + 4 = 4-8x$$

$$\begin{array}{r} -3x \qquad \qquad \qquad -3x \\ \hline \end{array}$$

$$4\sqrt{3x} + 4 = 4 - 11x$$

$$\begin{array}{r} -4 \quad -4 \\ \hline 4\sqrt{3x} = -11x \end{array}$$

$$8) -4\sqrt{3}(4\sqrt{5} + \sqrt{6})$$

$$6) \sqrt{3x+2} = \sqrt{4-8x}$$

$$(\sqrt{3x+2})(\sqrt{3x+2}) = 4-8x$$

$$(\sqrt{3x})(\sqrt{3x}) + 2\sqrt{3x} + 2\sqrt{3x} + 4 = 4-8x$$

$$3x + 4\sqrt{3x} + 4 = 4-8x$$

$$\begin{array}{r} -3x \\ \hline 4\sqrt{3x} + 4 = 4 - 11x \end{array}$$

$$\begin{array}{r} 4\sqrt{3x} + 4 = 4 - 11x \\ -4 \quad -4 \\ \hline \end{array}$$

$$(4\sqrt{3x})^2 = (-11x)^2$$

$$(4\sqrt{3x})(4\sqrt{3x}) = (-11x)(-11x)$$

$$16 \cdot 3x = 121x^2$$

$$48x = 121x^2$$

$$0 = 121x^2 - 48x \quad \begin{array}{l} \text{GCF} \\ \text{FACTOR} \end{array}$$

$$0 = x(121x - 48)$$

$$x = 0 \quad 121x - 48 = 0$$

$$121x = 48$$

$$x = 48/121$$

can't do this

~~$$(\sqrt{3x+2})^2 = (4-8x)^2$$~~

~~$$(\sqrt{3x+2})^2 = 48/121$$~~

$$x=0$$

$$0+2 = \sqrt{4-0}$$

$$2 = \sqrt{4}$$

$$2 = 2 \checkmark$$

9) $\sqrt{343x^4}$

$$\sqrt{49 \cdot 7 \cdot x^4}$$

$$7\sqrt{7} \cdot x^2$$

$$\boxed{7x^2\sqrt{7}}$$

1
4
9
16
25
36
49
64
81
100

10) $\sqrt{36k}$

$$6\sqrt{k}$$

11) $\sqrt{252p}$

$$\sqrt{36 \cdot 7} \sqrt{p}$$

$$6\sqrt{7} \cdot \sqrt{p}$$

$$6\sqrt{7p}$$

12) $\sqrt{48m^2}$

$$\sqrt{16 \cdot 3} \sqrt{m^2}$$

$$4\sqrt{3} \cdot m$$

$$4m\sqrt{3}$$

$$13) \frac{4\sqrt{6}}{2\sqrt{25}} = \frac{4\sqrt{6}}{2 \cdot 5} = \frac{4\sqrt{6}}{10} = \frac{2\sqrt{6}}{5}$$

$$\frac{4\sqrt{6} \div 2}{10 \div 2} = \frac{2\sqrt{6}}{5}$$

$$14) \frac{4\sqrt{3}}{5\sqrt{48}} = \frac{4\sqrt{3}}{5\sqrt{16 \cdot 3}} = \frac{4\sqrt{3}}{5 \cdot 4\sqrt{3}} = \frac{1}{5}$$

$$\frac{4\sqrt{3}}{20\sqrt{3}} = \frac{4}{20} = \frac{1}{5}$$

$$15) \frac{2\sqrt{15}}{3\sqrt{16}} = \frac{2\sqrt{15}}{3 \cdot 4} = \frac{2\sqrt{15}}{12} = \frac{\sqrt{15}}{6}$$

$$16) \frac{4\sqrt{6}}{\sqrt{27}} = \frac{4\sqrt{6}}{\sqrt{9 \cdot 3}} = \frac{4\sqrt{6}}{3\sqrt{3}}$$

$$\frac{4\sqrt{6} \cdot \sqrt{3}}{3\sqrt{3} \cdot \sqrt{3}} = \frac{4\sqrt{18}}{3 \cdot 3} = \frac{4\sqrt{18}}{9}$$

$$\frac{4\sqrt{9 \cdot 2}}{9} = \frac{4 \cdot 3\sqrt{2}}{9} = \frac{12\sqrt{2}}{9} = \frac{4\sqrt{2}}{3}$$

$$\frac{4\sqrt{6}}{3\sqrt{3}} = \frac{4}{3} \cdot \frac{\sqrt{6}}{\sqrt{3}}$$

$$\frac{4}{3} \cdot \sqrt{\frac{6}{3}}$$

$$\frac{4}{3} \cdot \sqrt{2} = \frac{4\sqrt{2}}{3}$$

Additional Problem

$$\frac{5}{(2+\sqrt{3})} \cdot \frac{(2-\sqrt{3})}{(2-\sqrt{3})} = \frac{5(2-\sqrt{3})}{4-3} = \frac{5(2-\sqrt{3})}{1} = 5(2-\sqrt{3})$$

17) $3\sqrt{54} - \sqrt{6} - \sqrt{6}$

$$\begin{aligned} & \quad \quad \quad \wedge \\ & 3\sqrt{9 \cdot 6} - \sqrt{6} - \sqrt{6} \\ & 3 \cdot 3\sqrt{6} - \sqrt{6} - \sqrt{6} \\ & 9\sqrt{6} - \sqrt{6} - \sqrt{6} \\ & 7\sqrt{6} \end{aligned}$$

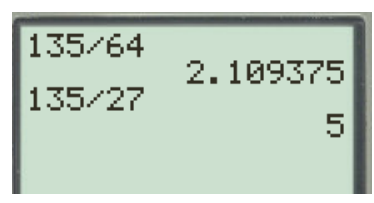
18) $3\sqrt{8} + 3\sqrt{8} + 2\sqrt{3}$

$$\begin{aligned} & \quad \quad \quad \wedge \\ & 3\sqrt{4 \cdot 2} + \\ & 3 \cdot 2\sqrt{2} \\ & 6\sqrt{2} + 6\sqrt{2} + 2\sqrt{3} \\ & 12\sqrt{2} + 2\sqrt{3} \end{aligned}$$

Additional problems

$$\begin{aligned} & \sqrt[3]{135x^5y^2} \\ & \begin{array}{c} \swarrow \quad \searrow \\ 3 \sqrt[3]{27} \cdot 5 \sqrt[3]{x^3} \sqrt[3]{y^2} \end{array} \\ & 3 \sqrt[3]{5} \cdot 5 \sqrt[3]{x^3} \sqrt[3]{y^2} \\ & 3 \times \sqrt[3]{5x^3y^2} \end{aligned}$$

1	$1^3 = 1$
2	$2^3 = 8$
3	$3^3 = 27$
4	$4^3 = 64$
5	$5^3 = 125$
6	$6^3 =$



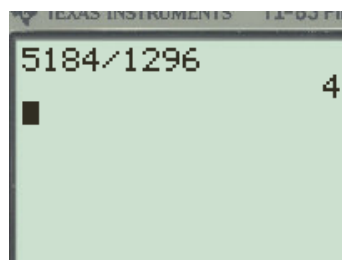
$$\sqrt[4]{5184x^3y^8}$$

$$\sqrt[4]{1296} \cdot \sqrt[4]{4}$$

$$6 \sqrt[4]{4} \cdot \sqrt[4]{x^3} \cdot y^2$$

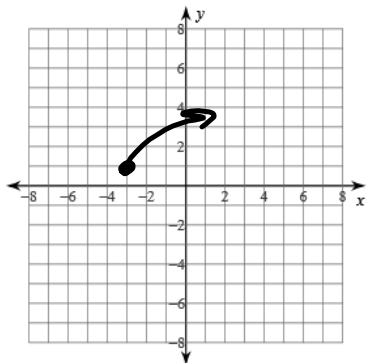
$$6y^2 \sqrt[4]{4x^3}$$

1	$1^4 = 1$
2	$2^4 = 16$
3	$3^4 = 81$
4	$4^4 = 256$
5	$5^4 = 625$
6	$6^4 = 1296$
7	$7^4 = 2401$

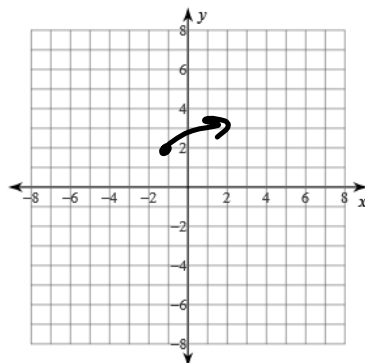


Sketch the graph of each function.

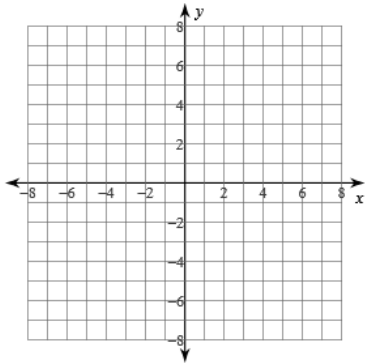
19) $y = 2\sqrt{x+3} + 1$



20) $y = \frac{2}{3}\sqrt{x+1} + 2$

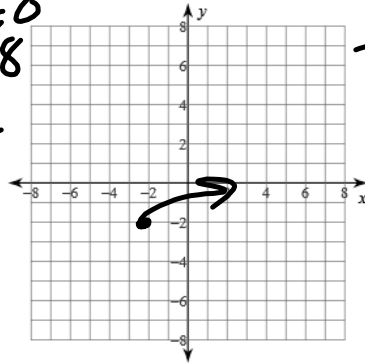


21) $y = 2\sqrt{x+2} - 5$



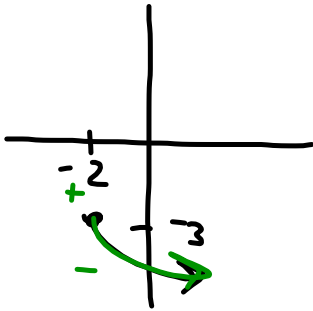
22) $y = \sqrt{4x+8} - 2$

$4x+8=0$
 $x=-2$

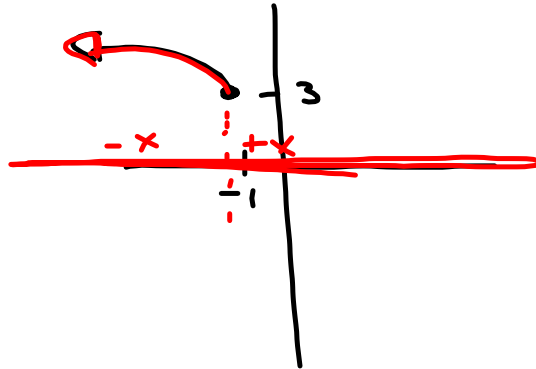


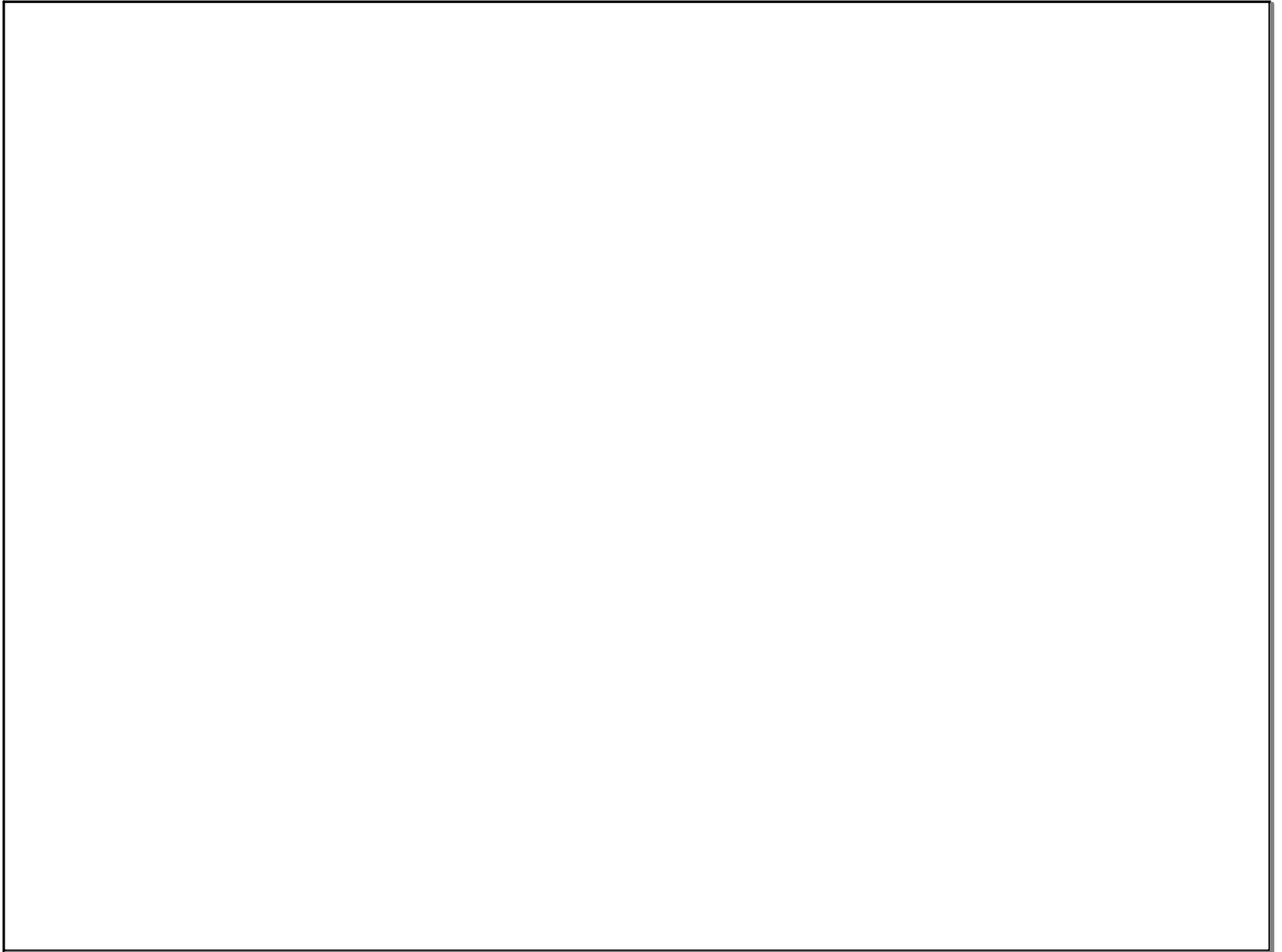
SKIP

$y = -\sqrt{x+2} - 3$



$y = \sqrt{-x+1} + 3$





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$$\begin{array}{r} 3-k = -4-2k \\ +2k \quad +2k \\ \hline 3+k = -4 \end{array}$$

$$\begin{array}{r} 3+k = -4 \\ -3 \quad -3 \\ \hline k = -7 \end{array}$$

3) $(x-4)^2 = (2x+7)^2$

$$\begin{aligned} (x-4)(x-4) &= 2x+7 \\ x^2 - 4x - 4x + 16 &= 2x+7 \\ x^2 - 8x + 16 &= 2x+7 \end{aligned}$$

$$x^2 - 10x + 9 = 0$$

$$\begin{array}{r} \\ 1 \cdot 9 \\ 3 \cdot 3 \\ -1 \cdot -9 \\ -3 \cdot -3 \end{array}$$

$$(x-1)(x-9) = 0$$

$$x=1 \quad x=9$$

GCF
Factor

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

check:

$$9 = \sqrt{73+8}$$

$$9 = \sqrt{81}$$

$$9 = 9 \checkmark$$

-1-

$$x-4 = \sqrt{2x+7}$$

~~x=1~~

x=9

$$1-4 = \sqrt{2(1)+7}$$

$$-3 = \sqrt{2+7}$$

$$-3 = \sqrt{9}$$

$$9-4 = \sqrt{2(9)+7}$$

$$5 = \sqrt{18+7}$$

$$5 = \sqrt{25}$$

$$5 = 5 \checkmark$$

2) $(\sqrt{2a-25})^2 = (\sqrt{a-9})^2$

$$2a-25 = a-9$$

$$a-25 = -9$$

$$a = 16$$

$$\sqrt{2(16)-25} = \sqrt{16-9}$$

$$\sqrt{32-25} = \sqrt{7}$$

$$\sqrt{7} = \sqrt{7} \checkmark$$

4) $9 = \sqrt{x+8}$

$$(9)^2 = (\sqrt{x+8})^2$$

$$81 = x+8$$

$$73 = x$$

$$5) 4 + \sqrt{n-3} = 13$$

$$\begin{array}{r} -4 \quad -4 \\ \hline \end{array}$$

$$\sqrt{n-3} = 9$$

$$(\sqrt{n-3})^2 = (9)^2$$

$$n-3 = 81$$

$$n = 84$$

check: $4 + \sqrt{84-3} = 13$

$$4 + \sqrt{81} = 13$$

$$4 + 9 = 13 \checkmark$$

Simplify.

$$7) 5\sqrt{15}(\sqrt{10} + 2\sqrt{6})$$

$$5\sqrt{15} \cdot \sqrt{10} + 5\sqrt{15} \cdot 2\sqrt{6}$$

$$5\sqrt{150} + 10\sqrt{90}$$

$$5 \cdot \sqrt{25 \cdot 6} + 10 \cdot \sqrt{9 \cdot 10}$$

$$5 \cdot 5\sqrt{6} + 10 \cdot 3\sqrt{10}$$

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

$$6) \sqrt{3x+2} = \sqrt{4-8x}$$

$$8) -4\sqrt{3}(4\sqrt{5} + \sqrt{6})$$

$$-16\sqrt{15} + -4\sqrt{18}$$

$$-16\sqrt{15} - 4 \cdot \sqrt{9 \cdot 2}$$

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

$$6) (\sqrt{3x+2})^2 (\sqrt{4-8x})^2$$

$$\sqrt{3} + 2$$

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

$$(\sqrt{3x+2})(\sqrt{3x+2}) = 4-8x$$

$$(\sqrt{3x})(\sqrt{3x}) + 2\sqrt{3x} + 2\sqrt{3x} + 4$$

$$3x + 4\sqrt{3x} + 4 = 4 - 8x$$

$$2 = \sqrt{4-8x} - \sqrt{3x}$$

$$-3x$$

$$4\sqrt{3x} + 4 = 4 - 11x$$

$$-4 -4$$

$$(4\sqrt{3x})^2 = (-11x)^2$$

$$(4\sqrt{3x})(4\sqrt{3x}) = (-11x)(-11x)$$

$$16 \cdot 3x = 121x^2$$

$$48x = 121x^2$$

$$0 = 121x^2 - 48x$$

$$0 = x(121x - 48)$$

GCF

FACTOR

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

$$x = 0$$

$$121x - 48 = 0$$

$$121x = 48$$

$$x = \frac{48}{121}$$

$$\sqrt{3x+2} = \sqrt{4-8x}$$

$$\sqrt{3(0)+2} = \sqrt{4-8(0)}$$

$$\sqrt{0} + 2 = \sqrt{4}$$

$$2 = \sqrt{4}$$

$$2 = 2 \checkmark$$

$$(x=0) \checkmark$$

$$\sqrt{3(\frac{48}{121})+2} = \sqrt{4-8(\frac{48}{121})}$$

$$\cancel{x = \frac{48}{121}}$$

$$5) 4 + \sqrt{n-3} = 13$$

$$6) \sqrt{3x+2} = \sqrt{4-8x}$$

$$(\sqrt{3x+2})(\sqrt{3x+2}) = 4-8x$$

$$(\sqrt{3x})(\sqrt{3x}) + 2\sqrt{3x} + 2\sqrt{3x} + 4 = 4-8x$$

$$3x + 4\sqrt{3x} + 4 = 4-8x$$

$$\begin{array}{r} -3x \\ \hline \end{array} \qquad \begin{array}{r} -3x \\ \hline \end{array}$$

$$\begin{array}{r} 4\sqrt{3x} + 4 = 4 - 11x \\ -4 \quad -4 \\ \hline \end{array}$$

$$4\sqrt{3x} = -11x$$

$$\begin{aligned}
 &9) \sqrt{343x^4} \\
 &\quad \wedge \\
 &\sqrt{49 \cdot 7} \cdot \sqrt{x^4} \\
 &\sqrt{49} \cdot \sqrt{7} \cdot \sqrt{x^4} \\
 &7\sqrt{7} \cdot x^2 \\
 &7x^2\sqrt{7}
 \end{aligned}$$

$$\begin{aligned}
 &10) \sqrt{36k} \\
 &6\sqrt{k}
 \end{aligned}$$

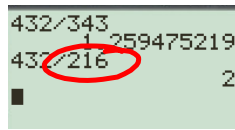
- 1
- 4
- 9
- 16
- 25
- 36
- 49
- 64
- 81
- 100

$$\begin{aligned}
 &11) \sqrt{252p} \\
 &\quad \wedge \\
 &\sqrt{36 \cdot 7} \cdot \sqrt{p} \\
 &6\sqrt{7} \cdot \sqrt{p} \\
 &6\sqrt{7p}
 \end{aligned}$$

$$\begin{aligned}
 &12) \sqrt{48m^2} \\
 &\quad \wedge \\
 &\sqrt{16 \cdot 3} \sqrt{m^2} \\
 &4\sqrt{3} \cdot m \\
 &4m\sqrt{3}
 \end{aligned}$$

Additional Problems

$$\begin{aligned}
 &\sqrt[3]{432x^3y^5} \\
 &\quad \wedge \\
 &\sqrt[3]{216 \cdot 2} \sqrt[3]{x^3} \sqrt[3]{y^5} \\
 &\sqrt[3]{216} \cdot \sqrt[3]{2} \cdot x \cdot y\sqrt[3]{y^2} \\
 &6 \cdot \sqrt[3]{2} \cdot x \cdot y\sqrt[3]{y^2} \\
 &6xy\sqrt[3]{2y^2}
 \end{aligned}$$



1	$1^3 = 1$
2	$2^3 = 8$
3	$3^3 = 27$
4	$4^3 = 64$
5	$5^3 = 125$
6	$6^3 = 216$
7	$7^3 = 343$
8	$8^3 = 512$

96/81

1.105195185

96/16

6

1	$1^4 = 1$
2	$2^4 = 16$
3	$3^4 = 81$
4	$4^4 = 256$
5	$5^4 =$
6	$6^4 =$

$\sqrt[4]{96x^2y^8}$

$\sqrt[4]{16 \cdot 6} \cdot \sqrt[4]{x^2} \cdot \sqrt[4]{y^8}$

$\sqrt[4]{16} \cdot \sqrt[4]{6} \cdot \sqrt[4]{x^2} \cdot \sqrt[4]{y^8}$

$2 \sqrt[4]{6} \cdot \sqrt[4]{x^2} \cdot y^2$

$2y^2 \sqrt[4]{6x^2}$

$$13) \frac{4\sqrt{6}}{2\sqrt{25}} = \frac{4\sqrt{6}}{2 \cdot 5} = \frac{4\sqrt{6}}{10} = \frac{2\sqrt{6}}{5}$$

$$14) \frac{4\sqrt{3}}{5\sqrt{48}} = \frac{4\sqrt{3}}{20\sqrt{3}} = \boxed{\frac{1}{5}}$$

$$\frac{5 \cdot \sqrt{16 \cdot 3}}{5 \cdot 4 \cdot \sqrt{3}}$$

$$15) \frac{2\sqrt{15}}{3\sqrt{16}} = \frac{2\sqrt{15}}{3 \cdot 4} = \frac{2\sqrt{15}}{12} = \frac{1\sqrt{15}}{6} = \frac{\sqrt{15}}{6}$$

$$16) \frac{4\sqrt{6}}{\sqrt{27}} = \frac{4\sqrt{6} \cdot \sqrt{3}}{3\sqrt{3} \cdot \sqrt{3}} = \frac{4\sqrt{18}}{3 \cdot 3} = \frac{4\sqrt{18}}{9}$$

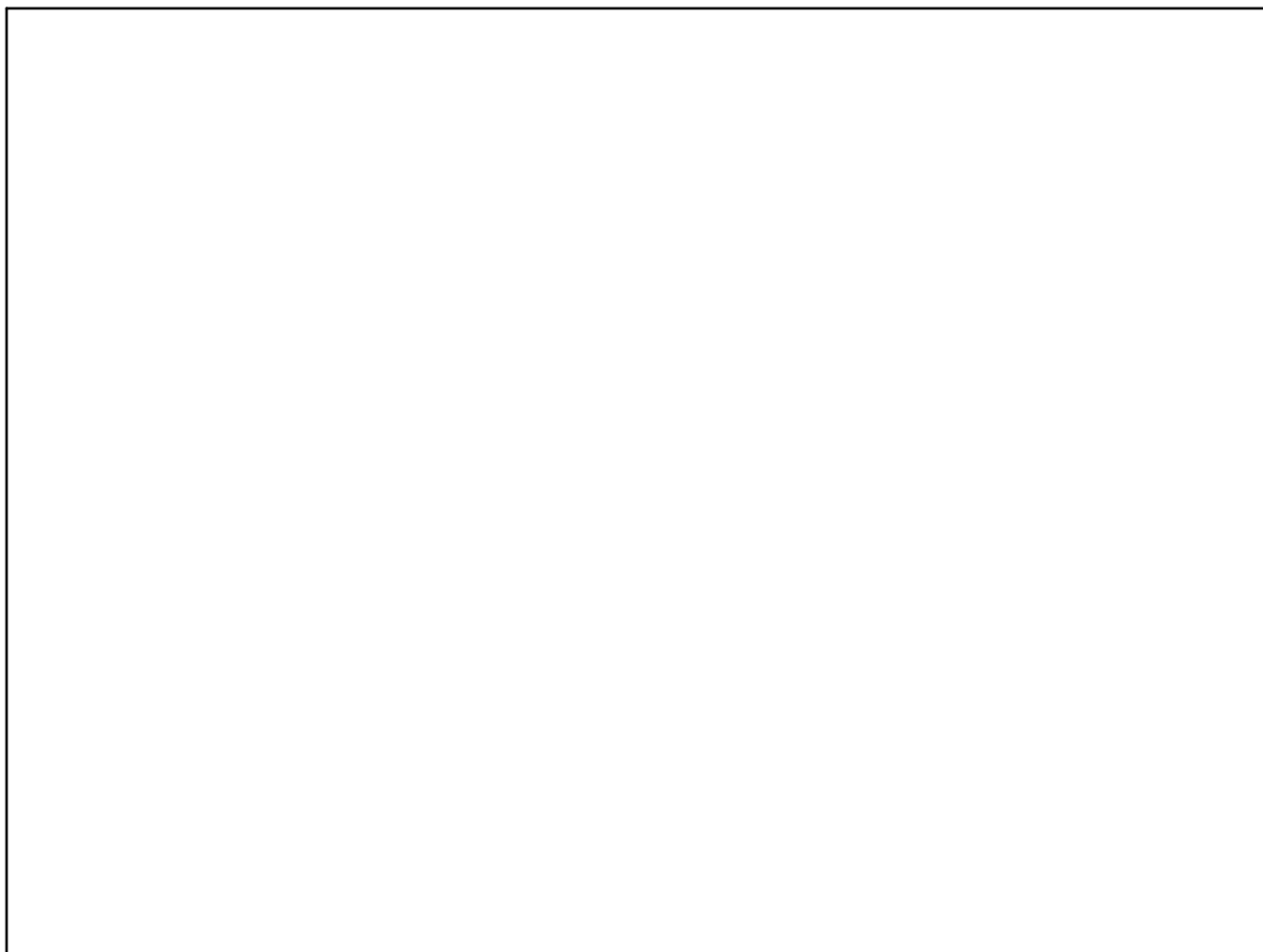
$$\frac{\sqrt{9 \cdot 3}}{3\sqrt{3}}$$

$$\frac{\sqrt{18}}{\sqrt{9 \cdot 2}} = \frac{\sqrt{18}}{3\sqrt{2}}$$

$$= \frac{4 \cdot 3\sqrt{2}}{9} = \frac{12\sqrt{2}}{9} = \boxed{\frac{4\sqrt{2}}{3}}$$

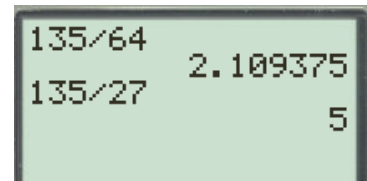
$$\frac{4\sqrt{6}}{3\sqrt{3}} = \frac{4}{3} \cdot \frac{\sqrt{6}}{\sqrt{3}} = \frac{4}{3} \sqrt{\frac{6}{3}} = \frac{4}{3} \cdot \sqrt{2} = \frac{4\sqrt{2}}{3}$$

$$\frac{5}{(2+\sqrt{3})} \cdot \frac{(2-\sqrt{3})}{(2-\sqrt{3})} = \frac{5(2-\sqrt{3})}{4-3} = \frac{5(2-\sqrt{3})}{1} = 5(2-\sqrt{3})$$

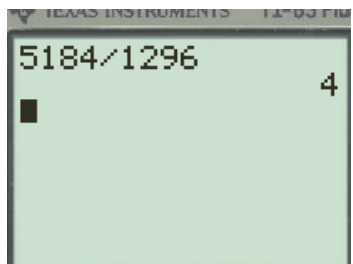
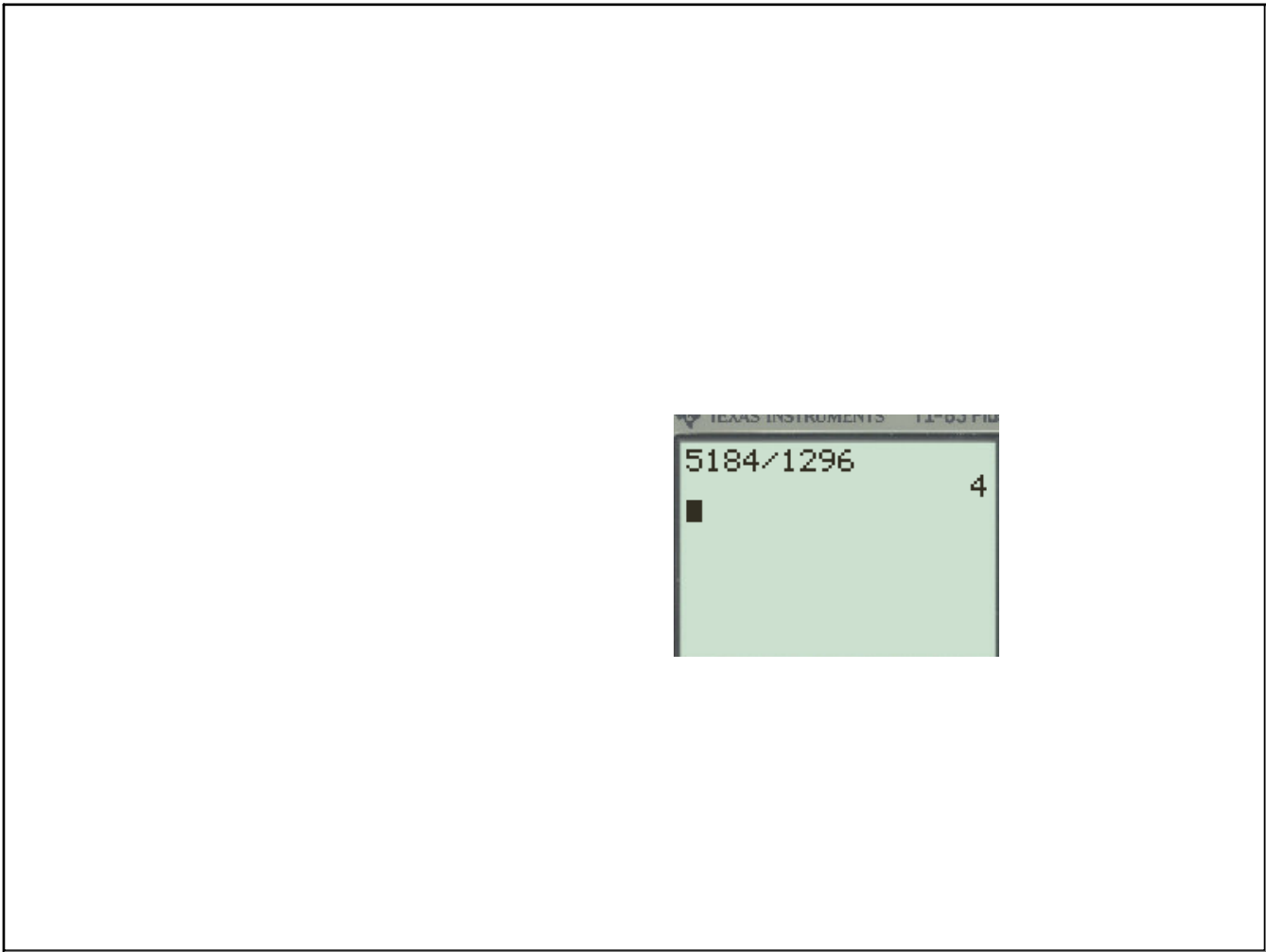


17) $3\sqrt{54} - \sqrt{6} - \sqrt{6}$

18) $3\sqrt{8} + 3\sqrt{8} + 2\sqrt{3}$

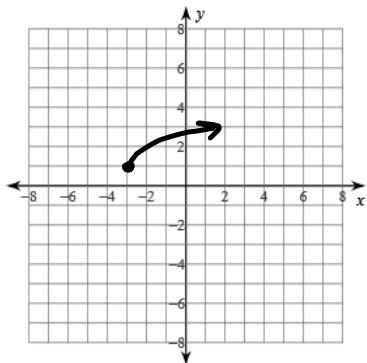


135/64	2.109375
135/27	5

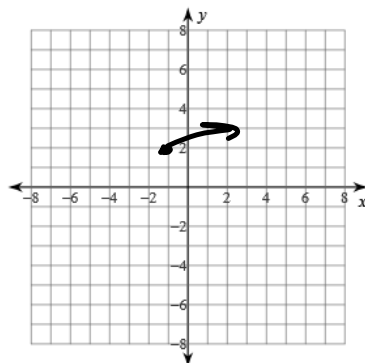


Sketch the graph of each function.

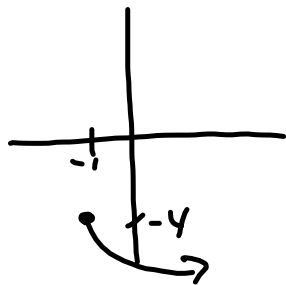
19) $y = 2\sqrt{x+3} + 1$



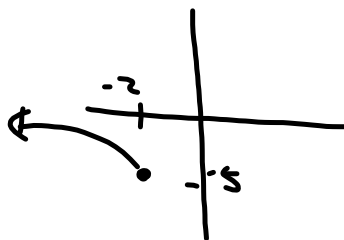
20) $y = \frac{1}{2}\sqrt{x+1} + 2$



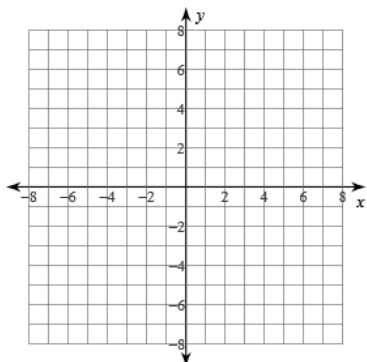
$y = -\sqrt{x+1} - 4$



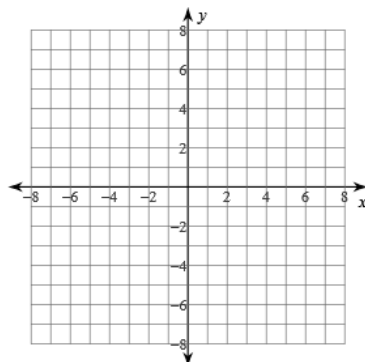
$y = \sqrt{-x+2} - 5$

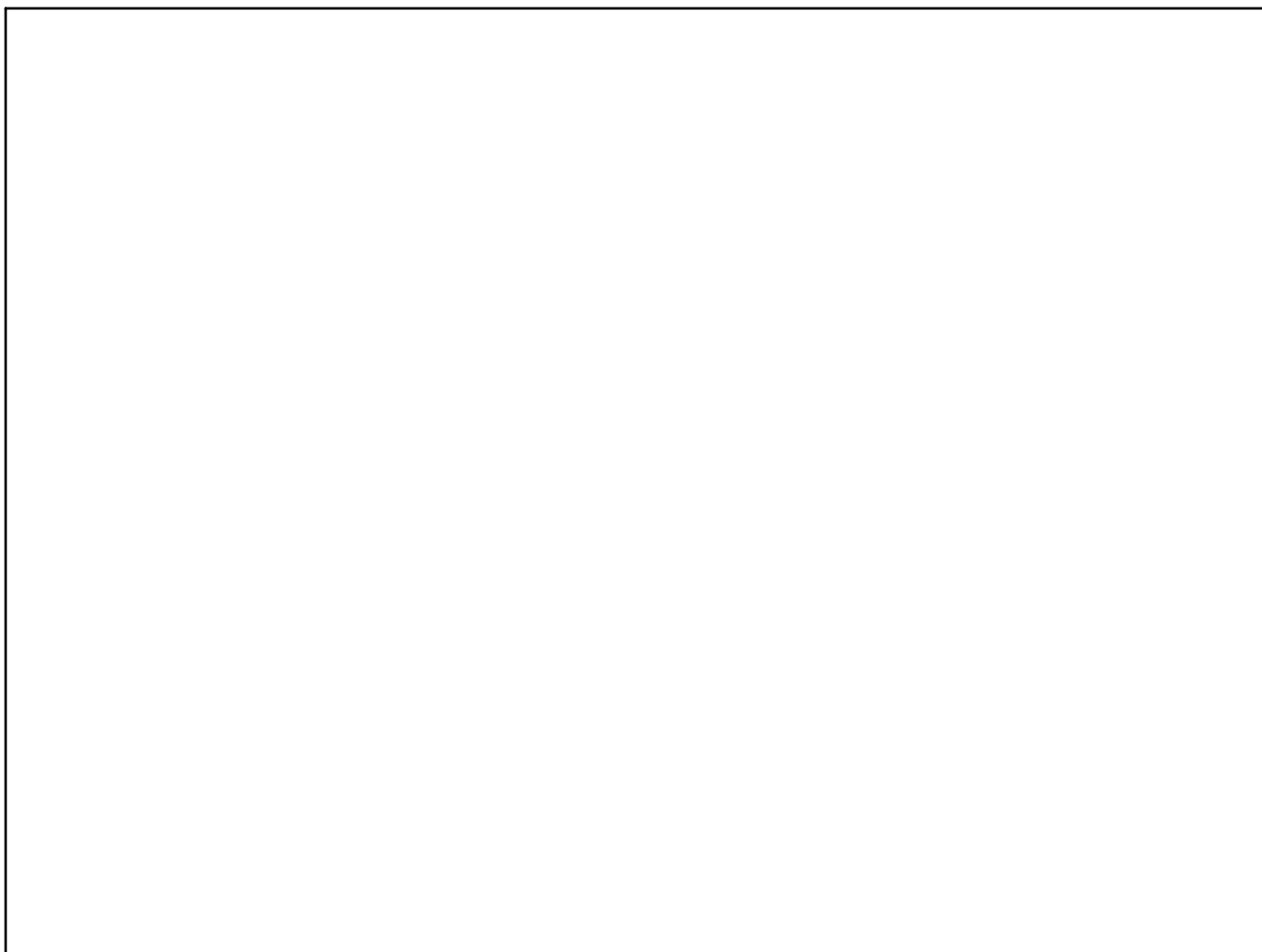


21) $y = 2\sqrt{x+2} - 5$



22) $y = \sqrt{4x+8} - 2$





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$$1) (\sqrt{3-k})^2 = (\sqrt{-4-2k})^2$$

$$3-k = -4-2k$$

$$\begin{array}{r} +2k \quad +2k \\ \hline 3+k = -4 \end{array}$$

$$3+k = -4$$

$$k = -7$$

Check: $\sqrt{3-(-7)} = \sqrt{-4-2(-7)}$

$$\sqrt{10} = \sqrt{10}$$

$$3) (x-4)^2 = (\sqrt{2x+7})^2$$

$$(x-4)(x-4) = 2x+7$$

$$x^2 - 4x - 4x + 16 = 2x + 7$$

$$x^2 - 8x + 16 = 2x + 7$$

$$x^2 - 10x + 9 = 0$$

$$\begin{array}{r} 1 \cdot 9 \\ 3 \cdot 3 \\ -1 \cdot -9 \\ -3 \cdot -3 \end{array}$$

$$(x-1)(x-9) = 0$$

~~$x=1$~~ $x=9$

$$x-4 = \sqrt{2x+7}$$

$$1-4 = \sqrt{2(1)+7}$$

$$-3 = \sqrt{9}$$

$$-3 \neq 3$$

$x=9$

$$x-4 = \sqrt{2x+7}$$

$$9-4 = \sqrt{2(9)+7}$$

$$5 = \sqrt{18+7}$$

$$5 = \sqrt{25}$$

$$5 = 5 \checkmark$$

$$2) (\sqrt{2a-25})^2 = (\sqrt{a-9})^2$$

$$2a-25 = a-9$$

$$\begin{array}{r} -a \quad -a \\ \hline a-25 = -9 \end{array}$$

$$a-25 = -9$$

$$a = 16$$

$$4) 9 = (\sqrt{x+8})^2$$

$$81 = x+8$$

$$73 = x$$

$$9 = \sqrt{73+8}$$

$$9 = \sqrt{81}$$

$$9 = 9 \checkmark$$

5) $4 + \sqrt{n-3} = 13$

$$\begin{array}{r} -4 \quad -4 \\ \hline (\sqrt{n-3})^2 = (9)^2 \end{array}$$

$n-3 = 81$

$n = 84$

$4 + \sqrt{84-3} = 13$

$4 + \sqrt{81} = 13$

$4 + 9 = 13 \checkmark$

Simplify

7) $5\sqrt{15}(\sqrt{10} + 2\sqrt{6})$

$5\sqrt{15} \cdot \sqrt{10} + 5\sqrt{15} \cdot 2\sqrt{6}$

$5\sqrt{150} + 10\sqrt{90}$

$5 \cdot \sqrt{25} \cdot \sqrt{6} \quad 10\sqrt{9} \cdot \sqrt{10}$

$5 \cdot 5 \cdot \sqrt{6} + 10 \cdot 3 \sqrt{10}$

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

6) $\sqrt{3x+2} = \sqrt{4-8x}$

8) $-4\sqrt{3}(4\sqrt{5} + \sqrt{6})$

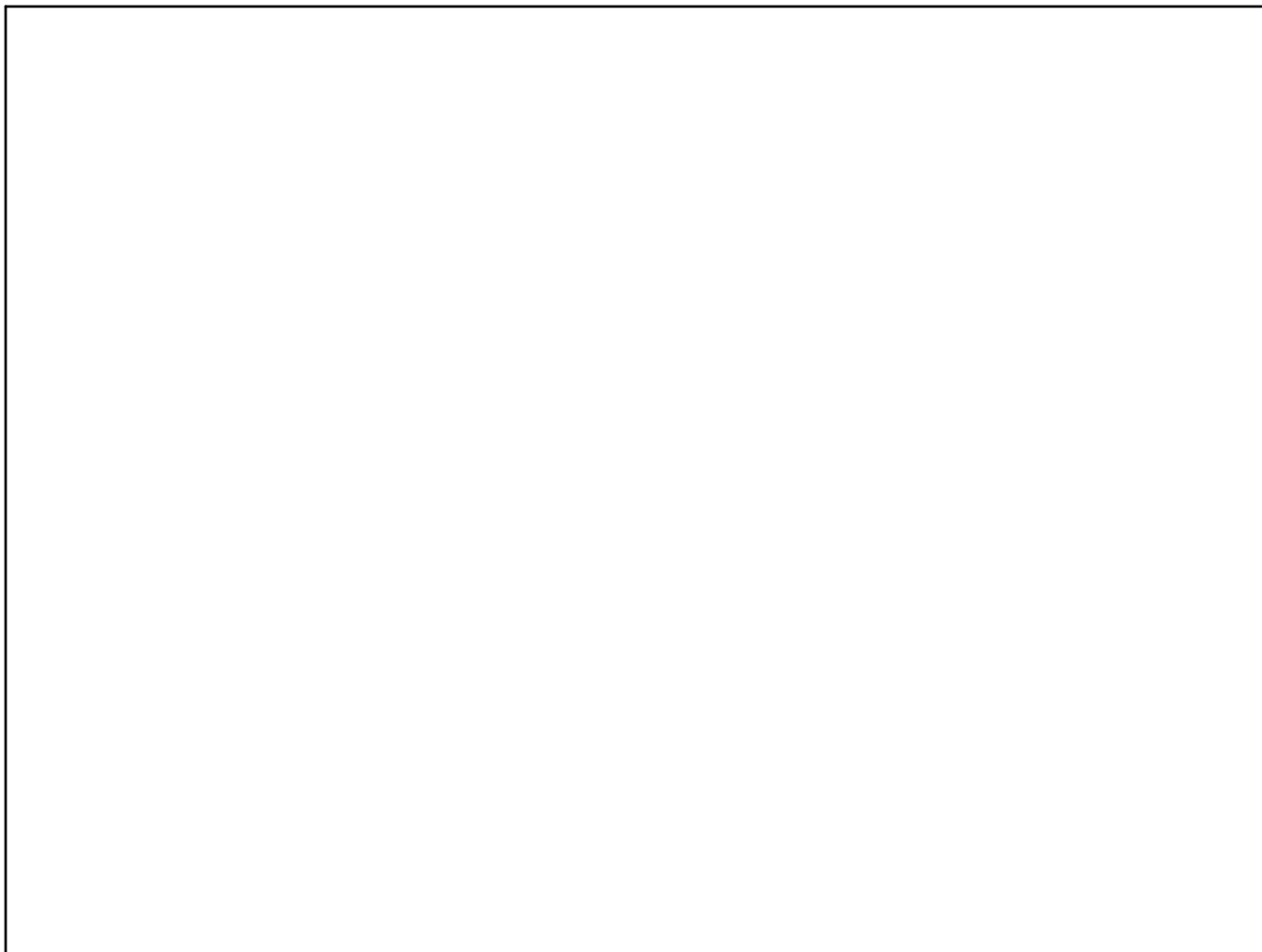
$-16\sqrt{15} + -4\sqrt{18}$

$-4 \cdot \sqrt{9} \cdot \sqrt{2}$

$-16\sqrt{15} + -4 \cdot 3\sqrt{2}$

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

1
4
9
16
25
36
49
64
81
100



$$6) (\sqrt{3x+2})^2 = (\sqrt{4-8x})^2$$

$$(\sqrt{3x+2})(\sqrt{3x+2}) = 4-8x$$

No
 $(\sqrt{3x})^2 + (2)^2$

$$(\sqrt{3x})(\sqrt{3x}) + 2\sqrt{3x} + 2\sqrt{3x} + 4 = 4-8x$$

$$\begin{array}{r} 3x + 4\sqrt{3x} + 4 = 4-8x \\ -3x \qquad \qquad \qquad -3x \\ \hline \end{array}$$

$$\begin{array}{r} 4\sqrt{3x} + 4 = 4-11x \\ -4 \quad -4 \\ \hline \end{array}$$

$$4\sqrt{3x} = -11x$$

$$(4\sqrt{3x})^2 = (-11x)^2$$

$$(4\sqrt{3x})(4\sqrt{3x}) = (-11x)(-11x)$$

$$16 \cdot 3x = 121x^2$$

$$48x = 121x^2$$

Check:

$$0 = 121x^2 - 48x$$

$$0 = x(121x - 48)$$

$$x = 0 \quad 121x - 48 = 0$$

~~$$x = \frac{48}{121}$$~~

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

$$6) \sqrt{3x+2} = \sqrt{4-8x}$$

$$(\sqrt{3x+2})(\sqrt{3x+2}) = 4-8x$$

$$(\sqrt{3x})(\sqrt{3x}) + 2\sqrt{3x} + 2\sqrt{3x} + 4 = 4-8x$$

$$3x + 4\sqrt{3x} + 4 = 4-8x$$

$$\begin{array}{r} -3x \\ \hline \end{array} \qquad \begin{array}{r} -3x \\ \hline \end{array}$$

$$\begin{array}{r} 4\sqrt{3x} + 4 = 4 - 11x \\ -4 \quad -4 \\ \hline \end{array}$$

$$4\sqrt{3x} = -11x$$

$$\begin{aligned}
 &9) \sqrt{343x^4} \\
 &\quad \wedge \\
 &\sqrt{49 \cdot 7} \cdot \sqrt{x^4} \\
 &7\sqrt{7} \cdot x^2 \\
 &7x^2\sqrt{7}
 \end{aligned}$$

$$\begin{aligned}
 &10) \sqrt{36k} \\
 &\sqrt{36} \cdot \sqrt{k} \\
 &6\sqrt{k}
 \end{aligned}$$

- 1
- 4
- 9
- 16
- 25
- 36
- 49
- 64
- 81
- 100

$$\begin{aligned}
 &11) \sqrt{252p} \\
 &\quad \wedge \quad \wedge \\
 &\sqrt{36} \sqrt{7} \sqrt{p} \\
 &6\sqrt{7p}
 \end{aligned}$$

$$\begin{aligned}
 &12) \sqrt{48m^2} \\
 &\quad \wedge \quad \wedge \quad \wedge \\
 &\sqrt{16} \sqrt{3} \sqrt{m^2} \\
 &4m\sqrt{3}
 \end{aligned}$$

$$\sqrt[3]{500x^5y^2}$$

$$\sqrt[3]{500x^5y^2}$$

$$\sqrt[3]{125 \cdot 4}$$

$$\sqrt[3]{125} \cdot \sqrt[3]{4} \cdot \sqrt[3]{x^5} \cdot \sqrt[3]{y^2}$$

$$5 \times \sqrt[3]{4x^2y^2}$$

1	$1^3 = 1$
2	$2^3 = 8$
3	$3^3 = 27$
4	$4^3 = 64$
5	$5^3 = 125$
6	$6^3 = 216$
7	$7^3 = 343$
8	$8^3 = 512$

$$\boxed{x \cdot x \cdot x}$$

$$\sqrt[3]{125} = 5$$

$$\sqrt[4]{1792x^8y^6}$$

$$\sqrt[4]{256} \sqrt[4]{7} \sqrt[4]{x^8} \sqrt[4]{y^6}$$

$$4 \sqrt[4]{7} \cdot x^2 \cdot y \sqrt[4]{y^2}$$

$$4x^2y \sqrt[4]{7y^2}$$

1	(1) ⁴	1
2	(2) ⁴	16
3	(3) ⁴	81
4	:	256
5	:	625
6	:	1296
7		2401

$$13) \frac{4\sqrt{6}}{2\sqrt{25}} = \frac{4\sqrt{6}}{2 \cdot 5}$$

$$= \frac{4\sqrt{6}}{10}$$

$$= \frac{2\sqrt{6}}{5}$$

$$14) \frac{4\sqrt{3}}{5\sqrt{48}}$$

$$= \frac{4\sqrt{3}}{5 \cdot \sqrt{16 \cdot 3}}$$

$$= \frac{4\sqrt{3}}{5 \cdot 4\sqrt{3}}$$

$$= \frac{4}{20} = \frac{1}{5}$$

$$\frac{4\sqrt{3}}{20\sqrt{3}} = \frac{4}{20} = \frac{1}{5}$$

$$15) \frac{2\sqrt{15}}{3\sqrt{16}}$$

$$= \frac{2\sqrt{15}}{3 \cdot 4} = \frac{2\sqrt{15}}{12} = \frac{\sqrt{15}}{6}$$

$$16) \frac{4\sqrt{6}}{\sqrt{27}} = \frac{4\sqrt{6}}{3\sqrt{3}}$$

$$= \frac{4\sqrt{6}}{3\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{4\sqrt{18}}{9}$$

$$\frac{\sqrt{18}}{3\sqrt{2}}$$

$$\frac{4 \cdot 3\sqrt{2}}{9}$$

$$\frac{12\sqrt{2}}{9}$$

$$\frac{4\sqrt{2}}{3}$$

$$\frac{4\sqrt{6}}{3\sqrt{3}} = \frac{4}{3} \left(\frac{\sqrt{6}}{\sqrt{3}} \right)$$

$$\frac{4}{3} \left(\sqrt{\frac{6}{3}} \right)$$

$$\frac{4\sqrt{2}}{3}$$

$$\frac{5}{(3-\sqrt{7})(3+\sqrt{7})} \cdot \frac{(3+\sqrt{7})}{(3+\sqrt{7})}$$

$$\frac{5(3+\sqrt{7})}{9-7} = \frac{5(3+\sqrt{7})}{2}$$

17) $3\sqrt{54} - \sqrt{6} - \sqrt{6}$

$$3\sqrt{9 \cdot 6} - \sqrt{6} - \sqrt{6}$$

$$3 \cdot 3\sqrt{6} - \sqrt{6} - \sqrt{6}$$

$$9\sqrt{6} - \sqrt{6} - \sqrt{6}$$

$$7\sqrt{6}$$

18) $3\sqrt{8} + 3\sqrt{8} + 2\sqrt{3}$

$$3\sqrt{4 \cdot 2}$$

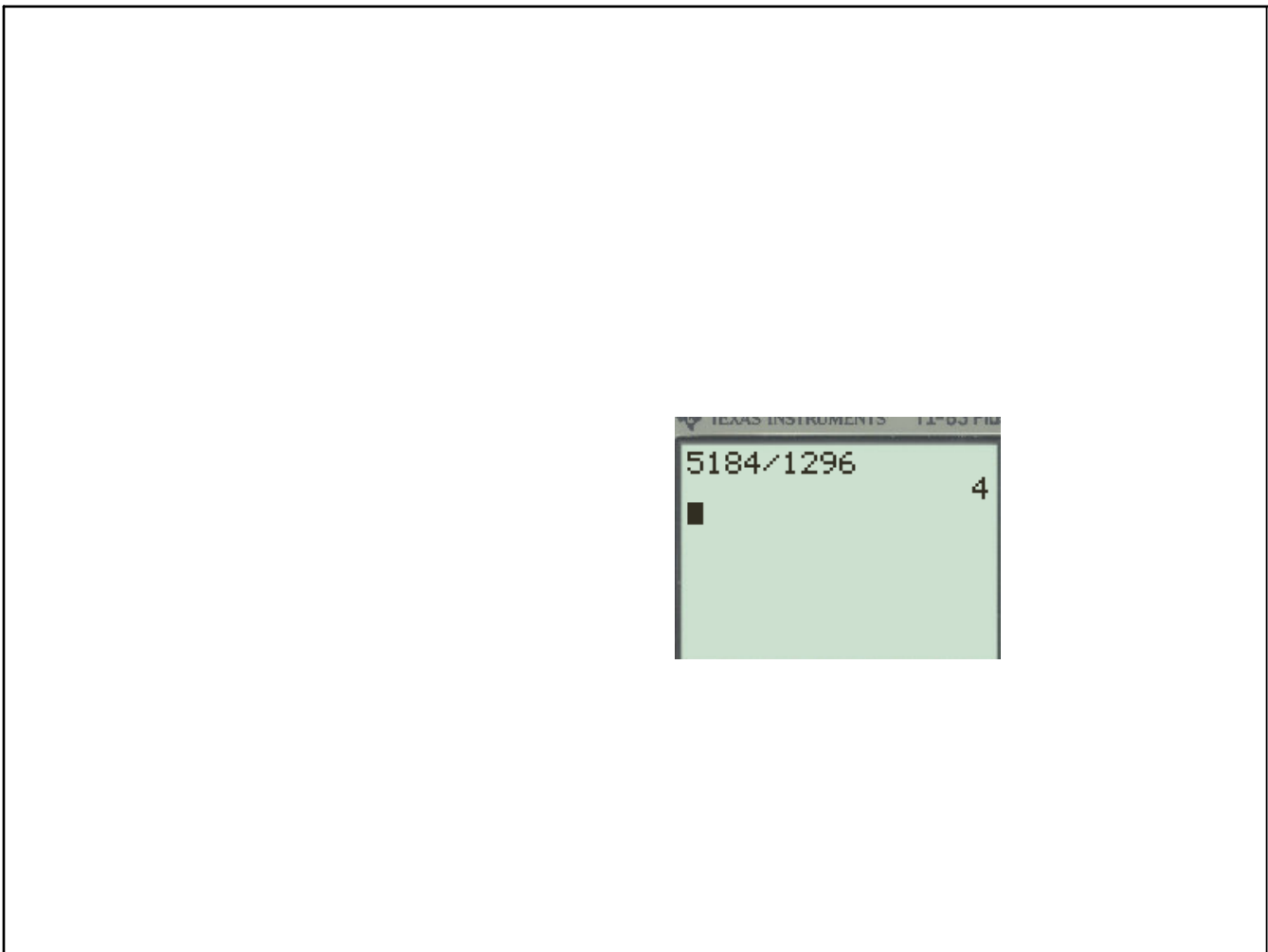
$$3 \cdot 2\sqrt{2} + 3 \cdot 2\sqrt{2} + 2\sqrt{3}$$

$$6\sqrt{2} + 6\sqrt{2} + 2\sqrt{3}$$

$$12\sqrt{2} + 2\sqrt{3}$$

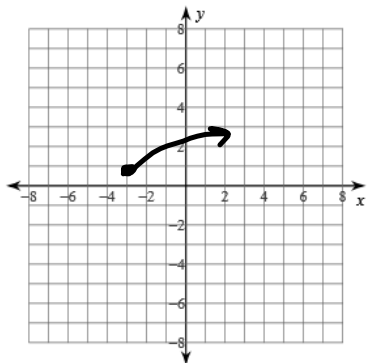
$$6\sqrt{8} + 2\sqrt{3}$$

135/64	2.109375
135/27	5



Sketch the graph of each function.

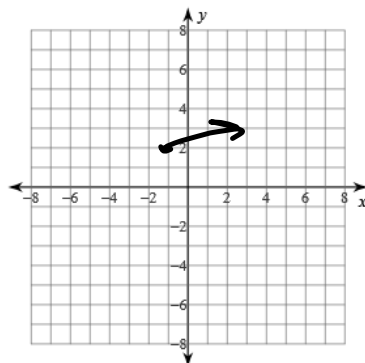
19) $y = 2\sqrt{x+3} + 1$



$y = -\sqrt{x+3} - 4$

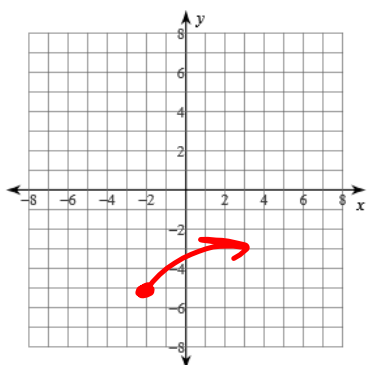
change sign

20) $y = \frac{1}{2}\sqrt{x+1} + 2$

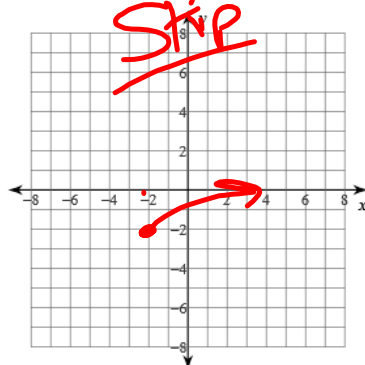


$y = \sqrt{-x+1} - 2$

21) $y = 2\sqrt{x+2} - 5$



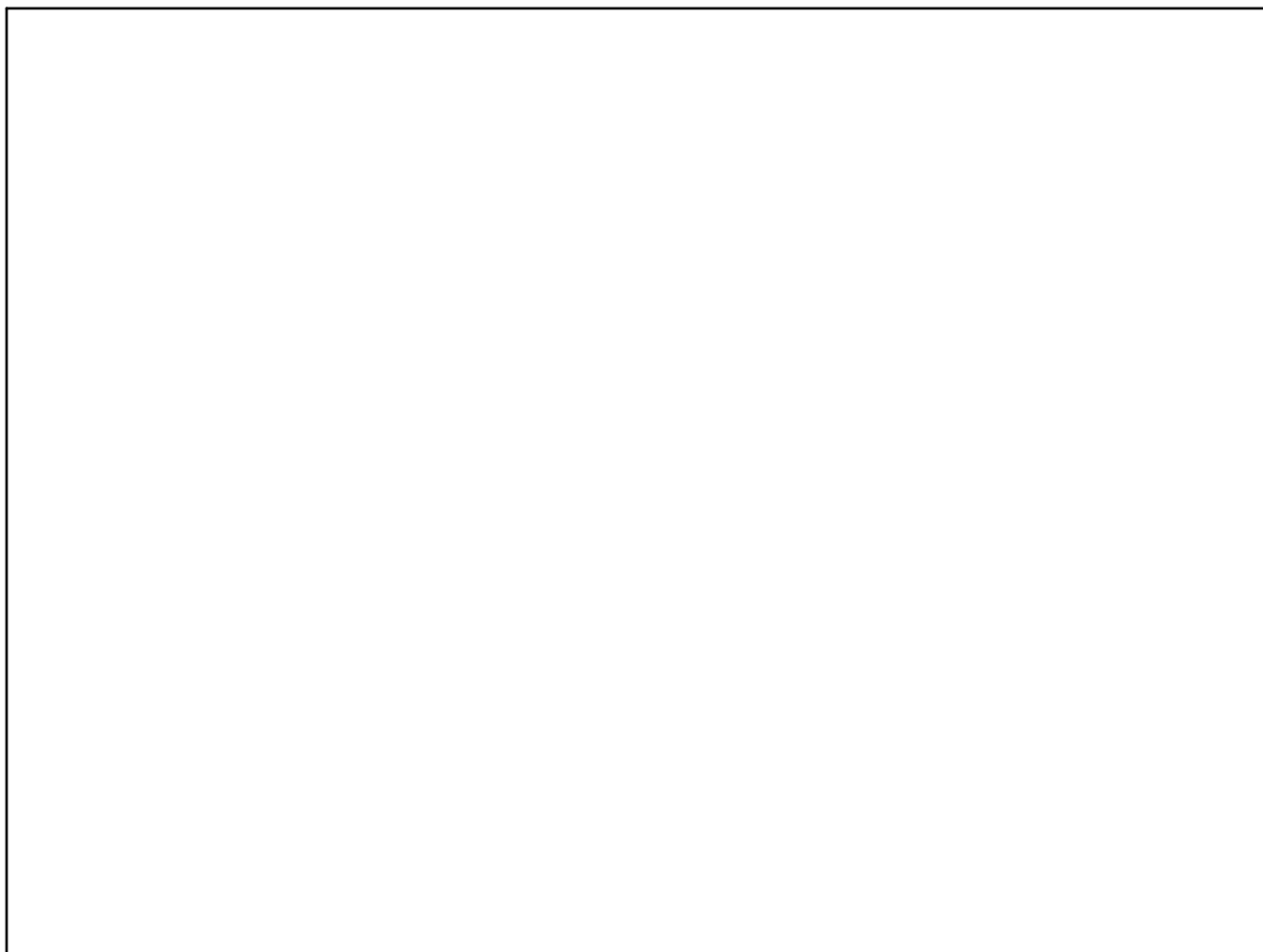
22) $y = \sqrt{4x+8} - 2$



$$4x + 8 = 0$$

$$4x = -8$$

$$x = -2$$



Algebra 2 CC

Name _____ ID: 1

Radical Practice Worksheet

Date _____ Period _____

Solve each equation. Remember to check for extraneous solutions.

1) $\sqrt{3-k} = \sqrt{-4-2k}$
 $\{-7\}$

2) $\sqrt{2a-25} = \sqrt{a-9}$
 $\{16\}$

3) $x-4 = \sqrt{2x+7}$
 $\{9\}$

4) $9 = \sqrt{x+8}$
 $\{73\}$

5) $4 + \sqrt{n-3} = 13$

 $\{84\}$

6) $\sqrt{3x+2} = \sqrt{4-8x}$

 $\{0\}$ **Simplify.**

7) $5\sqrt{15}(\sqrt{10} + 2\sqrt{6})$

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

8) $-4\sqrt{3}(4\sqrt{5} + \sqrt{6})$

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

$$9) \sqrt{343x^4}$$
$$7x^2\sqrt{7}$$

$$10) \sqrt{36k}$$
$$6\sqrt{k}$$

$$11) \sqrt{252p}$$
$$6\sqrt{7p}$$

$$12) \sqrt{48m^2}$$
$$4m\sqrt{3}$$

$$13) \frac{4\sqrt{6}}{2\sqrt{25}}$$
$$\frac{2\sqrt{6}}{5}$$

$$14) \frac{4\sqrt{3}}{5\sqrt{48}}$$
$$\frac{1}{5}$$

$$15) \frac{2\sqrt{15}}{3\sqrt{16}}$$
$$\frac{\sqrt{15}}{6}$$

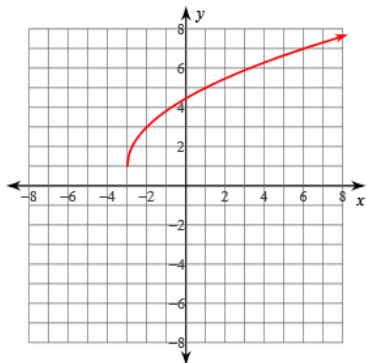
$$16) \frac{4\sqrt{6}}{\sqrt{27}}$$
$$\frac{4\sqrt{2}}{3}$$

$$17) 3\sqrt{54} - \sqrt{6} - \sqrt{6}$$
$$7\sqrt{6}$$

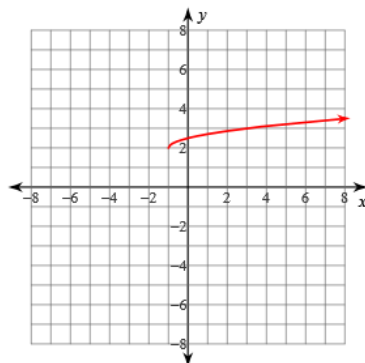
$$18) 3\sqrt{8} + 3\sqrt{8} + 2\sqrt{3}$$
$$12\sqrt{2} + 2\sqrt{3}$$

Sketch the graph of each function.

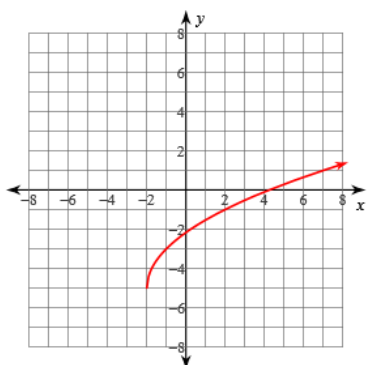
19) $y = 2\sqrt{x+3} + 1$



20) $y = \frac{1}{2}\sqrt{x+1} + 2$



21) $y = 2\sqrt{x+2} - 5$



22) $y = \sqrt{4x+8} - 2$

