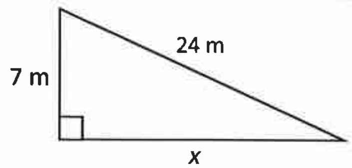
Mastery Algebra 1 Sample Mastery Quiz 10-1 Name: KEY

Per: ____ ☐

10-1 The Pythagorean Theorem

Find the missing side length in each triangle. If necessary, round to the nearest tenth.

1.



$7^2 + x^2 = 24^2$

$49 + x^2 = 576$

$-49 \qquad -49$

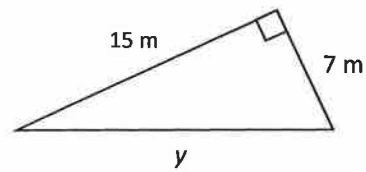
$x^2 = 527$

$x = \sqrt{527}$

≈ 22.95

$\boxed{x \approx 23.0\text{ m}}$

2.



$15^2 + 7^2 = y^2$

$225 + 49 = y^2$

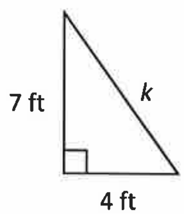
$274 = y^2$

$\sqrt{274} = y$

16.55

$\boxed{y \approx 16.6\text{ m}}$

3.



$7^2 + 4^2 = k^2$

$49 + 16 = k^2$

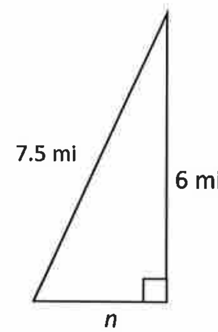
$65 = k^2$

$\sqrt{65} = k$

$k \approx 8.06$

$\boxed{k \approx 8.1\text{ ft}}$

4.



$n^2 + 6^2 = 7.5^2$

$n^2 + 36 = 56.25$

$-36 \qquad -36$

$n^2 = 20.25$

$n = \sqrt{20.25}$

$n \approx 4.5$

$\boxed{n = 4.5\text{ mi}}$

Are

5. Is it possible for the lengths 25, 60, and 65 to be the side lengths for a right triangle? Show how you know.

$25^2 + 60^2 = 65^2$?

$625 + 3600 = 4225$

$4225 = 4225$ ✓

Yes, 25, 60, and 65 are the side lengths for a right triangle.

Mastery Algebra 1 Sample Mastery Quiz 10-2 Name: KEY

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10-2 Simplifying Radicals

Simplify each radical expression.

1. $5\sqrt{700}$ $= 5\sqrt{100\cdot 7}$
$= 5\sqrt{100}\cdot\sqrt{7}$
$= 5\cdot 10\cdot\sqrt{7}$
$= \boxed{50\sqrt{7}}$

2. $\sqrt{8x}\cdot\sqrt{24x^3}$ $= \sqrt{192x^4}$
$= \sqrt{64}\sqrt{3}\sqrt{x^4}$
$= 8\cdot\sqrt{3}\cdot x^2$
$= \boxed{8x^2\sqrt{3}}$

3. $-5\sqrt{21}\cdot\left(-3\sqrt{14}\right)$

21
14
84
21

$= 15\sqrt{21\cdot 14}$
$= 15\sqrt{3\cdot 7\cdot 2\cdot 7}$
$= 15\sqrt{49}\sqrt{6}$
$= 15\cdot 7\cdot\sqrt{6}$
$= \boxed{105\sqrt{6}}$

4. $\dfrac{1}{\sqrt{6}}\cdot\dfrac{\sqrt{6}}{\sqrt{6}}$ $= \boxed{\dfrac{\sqrt{6}}{6}}$

5. $\dfrac{2\sqrt{3}}{\sqrt{5}}\cdot\dfrac{\sqrt{5}}{\sqrt{5}}$ $= \boxed{\dfrac{2\sqrt{15}}{5}}$

Mastery Algebra 1 Sample Mastery Quiz 10-3 Name: KEY

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10-3 Operations with Radical Expressions

Simplify each radical expression.

1. $2\sqrt{18} - 4\sqrt{32}$

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

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

$= 6\sqrt{2} - 16\sqrt{2}$

$= \boxed{-10\sqrt{2}}$

2. $3\sqrt{28} - \sqrt{63}$

$3\sqrt{4}\sqrt{7} - \sqrt{9}\sqrt{7}$

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

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

$= \boxed{3\sqrt{7}}$

3. $\sqrt{5}\left(\sqrt{15} - 3\right) = \sqrt{75} - 3\sqrt{5}$

$= \sqrt{25}\sqrt{3} - 3\sqrt{5}$

$= \boxed{5\sqrt{3} - 3\sqrt{5}}$

4. $\left(\sqrt{6} + \sqrt{3}\right)\left(\sqrt{2} - 2\right)$

	$\sqrt{2}$	-2
$\sqrt{6}$	$\sqrt{12}$	$-2\sqrt{6}$
$+\sqrt{3}$	$\sqrt{6}$	$-2\sqrt{3}$

$= \sqrt{12} - \sqrt{6} - 2\sqrt{3}$

$= \sqrt{4}\sqrt{3} - \sqrt{6} - 2\sqrt{3}$

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

$= \boxed{-\sqrt{6}}$

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

	$3\sqrt{2}$	$-5\sqrt{3}$
$3\sqrt{2}$	18	$-15\sqrt{6}$
$-5\sqrt{3}$	$-15\sqrt{6}$	75

$= \boxed{93 - 30\sqrt{6}}$

Mastery Algebra 1 Sample Mastery Quiz 10-4 Name: KEY

Per: ____

10-4 Solving Radical Equations

Solve each radical equation and check your solution. If there is no solution, write *no solution*.

1. $\sqrt{3t}+2=8$

$-2 \quad -2$

$(\sqrt{3t})^2=(6)^2$

$\frac{3t}{3}=\frac{36}{3}$

$\boxed{t=12}$

Check:

$\sqrt{3\cdot 12}+2=8$?

$\sqrt{36}+2=8$

$6+2=8$

$8=8$ ✓

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

$2n-4=36$

$+4 \quad +4$

$\frac{2n}{2}=\frac{40}{2}$

$\boxed{n=20}$

Check:

$\sqrt{2(20)-4}=6$?

$\sqrt{40-4}=6$

$\sqrt{36}=6$

$6=6$ ✓

3. $(\sqrt{2x-1})^2=(x)^2$

$2x-1=x^2$

$-2x+1 \quad -2x+1$

$0=x^2-2x+1$

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

$x-1=0$

$+1 \quad +1$

$\boxed{x=1}$

1

$-1 \quad -1$

-2

Check:

$\sqrt{2(1)-1}=1$?

$\sqrt{2-1}=1$

$\sqrt{1}=1$

$1=1$ ✓

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

$x-4=3x+2$

$-x \quad -x$

$-4=2x+2$

$-2 \quad -2$

$\frac{-6}{2}=\frac{2x}{2}$

$-3=x$

$\boxed{\varnothing}$ No real number solution

Check:

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

$\sqrt{-7}=\sqrt{-9+2}$

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

true, but $\sqrt{-7}$ is not a real #

5. $(\sqrt{r+5})^2=(2\sqrt{r-1})^2$

$r+5=4(r-1)$

$r+5=4r-4$

$-r \quad -r$

$5=3r-4$

$+4 \quad +4$

$\frac{9}{3}=\frac{3r}{3}$

$\boxed{3=r}$

Check:

$\sqrt{3+5}=2\sqrt{3-1}$

$\sqrt{8}=2\sqrt{2}$

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

$2\sqrt{2}=2\sqrt{2}$ ✓

$x=2$

$x^2=4$

Mastery Algebra 1 .   Sample Mastery Quiz 10-5   Name: KEY

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10-5 Graphing Square Root Functions

Find the domain of each function:

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

$x-3 \geq 0$
$+3 \quad +3$

$\boxed{x \geq 3}$

2. $y=\frac{1}{2}\sqrt{2x+8}$

$2x+8 \geq 0$
$-8 \quad -8$

$\frac{2x}{2} \geq \frac{-8}{2}$

$\boxed{x \geq -4}$

3 ~~2~~. Given the square root function $y=-2\sqrt{x+4}$

$x+4 \geq 0$
$-4 \quad -4$

$x \geq -4$

a. Choose appropriate values for x and complete the table below (min 5 points):

→ If necessary, round to nearest tenth

x	$y=-2\sqrt{x+4}$	y
-4	$y=-2\sqrt{-4+4}$	0
-3	$-2\sqrt{-3+4}$	-2
-2	$-2\sqrt{-2+4}$	-2.8
-1	$-2\sqrt{-1+4}$	-3.5
0	$-2\sqrt{0+4}$	-4
1	$-2\sqrt{1+4}$	-4.5
5	$-2\sqrt{5+4}$	-6

b. Use your points to graph the function. Graph accurately to the edge of the grid.