

Name

KEY

Show your work on all problems, and leave your solutions in the simplest form possible.

1.) Simplify.

$$\sqrt{4x^2 + 20x + 25}$$

$$= \sqrt{(2x+5)^2}$$

$$= |2x+5|$$

$$\boxed{|2x+5|}$$

2.) Rewrite with rational exponents.

$$\sqrt[3]{x^4} = x^{4/3}$$

$$\boxed{x^{4/3}}$$

3.) Simplify.

$$\sqrt{60x^7}$$

$$\sqrt{(4)(15)x^7}$$

$$2x^3\sqrt{15x}$$

$$\boxed{2x^3\sqrt{15x}}$$

4.) Simplify.

$$\sqrt[3]{x^5y^6z^7}$$

$$xy^2z\sqrt{x^2z}$$

$$\boxed{xy^2z\sqrt{x^2z}}$$

5.) Divide, and if possible, simplify.

$$\frac{\sqrt{72x^8}}{\sqrt{2x^5}} = \sqrt{\frac{72x^8}{2x^5}}$$
$$= \sqrt{36x^3}$$
$$= 6x\sqrt{x}$$

$$\frac{6x\sqrt{x}}{1}$$

6.) Perform the indicated operation and then simplify.

$$\sqrt{2}(\sqrt{72} - \sqrt{32})$$
$$= \sqrt{144} - \sqrt{64}$$
$$= 12 - 8$$
$$= 4$$

$$\frac{4}{1}$$

7.) Rationalize the denominator.

$$\frac{\sqrt{7}}{\sqrt{10x}} \cdot \frac{\sqrt{10x}}{\sqrt{10x}} = \frac{\sqrt{70x}}{10x}$$

$$\frac{\sqrt{70x}}{10x}$$

8.) Rationalize the denominator.

$$\frac{4}{\sqrt{7}-\sqrt{2}} \cdot \frac{\sqrt{7}+\sqrt{2}}{\sqrt{7}+\sqrt{2}}$$
$$= \frac{4\sqrt{7} + 4\sqrt{2}}{7-2}$$
$$= \frac{4\sqrt{7} + 4\sqrt{2}}{5}$$

$$\frac{4\sqrt{7} + 4\sqrt{2}}{5}$$

9.) Solve.

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

Check $\textcircled{6}$ ✓
 $6 \stackrel{?}{=} \sqrt{42-6}$ ✓

$$x^2 = 7x - 6$$

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

$$x = \frac{7 \pm \sqrt{49-24}}{2}$$

$$\frac{7+5}{2} = \textcircled{6}$$

$$\frac{7-5}{2} = \textcircled{+1}$$

$$\boxed{6, 1}$$

Check $\textcircled{+1}$ ✓
 $+1 \stackrel{?}{=} \sqrt{+7-6}$ ✓

$$\boxed{x = 29}$$

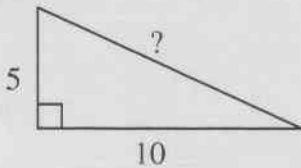
10.) $\sqrt[3]{x-2} + 7 = 10$
-7 -7

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

$$\begin{array}{r} x-2 = 27 \\ +2 \quad +2 \\ \hline x = 29 \end{array}$$

For problems 11 and 12, find the missing length(s).

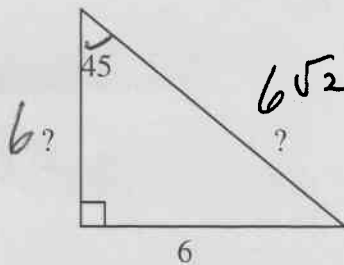
11.)



$$\begin{aligned} c^2 &= 100 + 25 \\ c^2 &= 125 \end{aligned}$$

$$\boxed{\sqrt{125}} = 5\sqrt{5}$$

12.)



$$\underline{6, 6\sqrt{2}}$$