

4.3 Solving Rational Equations

Homework

Name: Key

Date: _____ Block: _____

Solve the following radical equations. Do not forget to check for extraneous solutions!

$$1. \sqrt{2p} + 3 = 10$$

$$-3 \quad -3$$

$$(\sqrt{2p})^2 = (7)^2$$

$$\frac{2p}{2} = \frac{49}{2}$$

$$\boxed{p = \frac{49}{2}}$$

$$2. \sqrt{1-4t} - 8 = -6$$

$$+8 \quad +8$$

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

$$1-4t = 4$$

$$-4t = 3$$

$$\boxed{t = -\frac{3}{4}}$$

$$3. (\sqrt{2x+5})^2 = (\sqrt{2x+1})^2$$

$$2x+5 = 2x+1$$

$$5 = 1$$

$\boxed{\text{No Solution}}$

$$4. 4\sqrt{3h} - 2 = 0$$

$$+2 \quad +2$$

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

$$(\sqrt{3h})^2 = \left(\frac{1}{2}\right)^2$$

$$3h = \frac{1}{4}$$

$$\boxed{h = \frac{1}{12}}$$

$$5. 4\sqrt[4]{3x+4} - 8 = 0$$

$$+8 \quad +8$$

$$\frac{4\sqrt[4]{3x+4}}{4} = \frac{8}{4}$$

$$(\sqrt[4]{3x+4})^4 = (2)^4$$

$$3x+4 = 16$$

$$3x = 12$$

$$\boxed{x = 4}$$

$$6. 7 + \sqrt[3]{2x+5} = 4$$

$$-7 \quad -7$$

$$(\sqrt[3]{2x+5})^3 = (-3)^3$$

$$2x+5 = -27$$

$$-5 \quad -5$$

$$\frac{2x}{2} = \frac{-32}{2}$$

$$\boxed{x = -16}$$

$$7. (\sqrt[3]{3r-6})^3 = (3)^3$$

$$3r-6 = 27$$

$$+6 \quad +6$$

$$3r = 33$$

$$\boxed{r = 11}$$

$$8. (\sqrt[3]{11d+2})^3 = (7)^3$$

$$11d+2 = 343$$

$$11d = 341$$

$$\boxed{d = 31}$$

$$9. 6 + \sqrt[3]{q-4} = 9$$

$$-6 \quad -6$$

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

$$q-4 = 27$$

$$\boxed{q = 31}$$

$$10. 4\sqrt[4]{5x-4} = 12$$

$$\frac{4\sqrt[4]{5x-4}}{4} = \frac{12}{4}$$

$$(\sqrt[4]{5x-4})^4 = (3)^4$$

$$5x-4 = 81$$

$$5x = 85$$

$$\boxed{x = 17}$$

$$11. 1 + \sqrt[5]{6x+2} = 3$$

$$\begin{array}{r} -1 \qquad -1 \\ (\sqrt[5]{6x+2})^5 = (2)^5 \end{array}$$

$$6x+2=32$$

$$6x=30$$

$$\boxed{x=5}$$

$$12. \sqrt[3]{4m+4} - 2 = 2$$

$$\begin{array}{r} +2 \quad +2 \\ (\sqrt[3]{4m+4})^3 = (4)^3 \end{array}$$

$$4m+4=64$$

$$4m=60$$

$$\boxed{m=15}$$

$$13. 7\sqrt[3]{x+11} - 2 = 12$$

$$\begin{array}{r} +2 \quad +2 \\ \frac{7\sqrt[3]{x+11}}{7} = \frac{14}{7} \end{array}$$

$$(\sqrt[3]{x+11})^3 = (2)^3$$

$$x+11=8$$

$$\boxed{x=-3}$$

$$14. 6\sqrt[3]{2x-1} - 25 = 5$$

$$\begin{array}{r} +25 \quad +25 \\ \frac{6\sqrt[3]{2x-1}}{6} = \frac{30}{6} \end{array}$$

$$(\sqrt[3]{2x-1})^3 = (5)^3$$

$$2x-1=125$$

$$2x=126$$

$$\boxed{x=63}$$

$$15. 4\sqrt[4]{2x+1} - 4 = 0$$

$$\begin{array}{r} +4 \quad +4 \\ \frac{4\sqrt[4]{2x+1}}{4} = \frac{4}{4} \end{array}$$

$$(\sqrt[4]{2x+1})^4 = (1)^4$$

$$2x+1=1$$

$$2x=0$$

$$\boxed{x=0}$$

$$16. \sqrt[5]{5x-22} - 8 = -5$$

$$\begin{array}{r} +8 \quad +8 \\ (\sqrt[5]{5x-22})^5 = (3)^5 \end{array}$$

$$5x-22=243$$

$$5x=265$$

$$\boxed{x=53}$$

$$17. (7v-2)^{\frac{1}{4}} + 12 = 7$$

$$\begin{array}{r} \sqrt[4]{7v-2} + 12 = 7 \\ -12 \quad -12 \end{array}$$

$$\sqrt[4]{7v-2} = -5$$

↑

Can't be
negative!

No Solution!

$$18. (6u-5)^{\frac{1}{3}} + 2 = -3$$

$$\begin{array}{r} \sqrt[3]{6u-5} + 2 = -3 \\ -2 \quad -2 \end{array}$$

$$(\sqrt[3]{6u-5})^3 = (-5)^3$$

$$6u-5=-125$$

$$6u=-120$$

$$\boxed{u=-20}$$