

Name _____

Radical Review

Date _____

Period _____

Simplify. Assume that all variables represent positive real numbers. no absolute values!

$$1. \sqrt{\frac{3}{28}} \cdot \sqrt{\frac{1}{7}}$$

$$\frac{\sqrt{3} \cdot 1}{\sqrt{7} \sqrt{4} \sqrt{7}} = \frac{\sqrt{3}}{14}$$

$$2. \frac{2\sqrt{3}}{\sqrt{18}} \quad \text{rationalize}$$

$$\downarrow$$

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

$$3. \sqrt{\frac{1}{3}} - \sqrt{12} \quad \frac{1}{\sqrt{3}} - 2\sqrt{3}$$

$$\frac{1\sqrt{3}}{3} - 2\sqrt{3} = \frac{\sqrt{3} - 6\sqrt{3}}{3} = \frac{-5\sqrt{3}}{3}$$

common denominator $\rightarrow 3$

$$4. \sqrt{24} - \sqrt{54}$$

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

$$-1\sqrt{6}$$

$$5. 2\sqrt{5} - \sqrt{\frac{3}{5}}$$

$$2\sqrt{5} - \frac{\sqrt{3}}{\sqrt{5}} = 2\sqrt{5} - \frac{\sqrt{15}}{5}$$

$$\frac{10\sqrt{5} - \sqrt{15}}{5}$$

$$6. -3\sqrt{27} + 3\sqrt{45} - 3\sqrt{27}$$

$$-9\sqrt{3} + 9\sqrt{5} - 9\sqrt{3}$$

$$-18\sqrt{3} + 9\sqrt{5}$$

$$7. -2\sqrt{6} - 3\sqrt{6} + 2\sqrt{12}$$

$$-5\sqrt{6} + 4\sqrt{3}$$

$$8. \sqrt{6x} \cdot \sqrt{15x} \quad \sqrt{90x^2}$$

$$\sqrt{10} \sqrt{9} \sqrt{x^2}$$

$$3x\sqrt{10}$$

$$9. \sqrt{48x^2y^4}$$

$$4xy^2\sqrt{3}$$

$$10. \sqrt{256xy^4z^4}$$

$$16y^2z^2\sqrt{x}$$

$$11. -\sqrt{15n^2} \cdot 4\sqrt{10n}$$

$$-4\sqrt{150n^3}$$

$$-4\sqrt{25} \sqrt{6} \sqrt{n^2} \sqrt{n}$$

$$-20n\sqrt{6n}$$

$$12. (\sqrt{3} - 4)^2 \quad \text{remember to foil!}$$

$$(\sqrt{3} - 4)(\sqrt{3} - 4)$$

$$3 - 4\sqrt{3} - 4\sqrt{3} + 16$$

$$19 - 8\sqrt{3}$$

$$13. \sqrt{2}(\sqrt{12} + 2) \quad \text{distribute!}$$

$$\sqrt{24} + 2\sqrt{2}$$

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

$$14. (\sqrt{5} + \sqrt{6})(\sqrt{5} - \sqrt{6}) \quad \text{FOIL!}$$

$$5 - 6$$

$$-1$$

$$15. \frac{2\sqrt{3}}{\sqrt{3}} - \frac{\sqrt{5}\sqrt{3}}{\sqrt{3}} \quad \frac{\sqrt{5}}{\sqrt{3}} \quad \frac{\sqrt{3}}{\sqrt{3}}$$

$$\frac{2\sqrt{9} - \sqrt{15} - \sqrt{15}}{3} = \frac{6 - 2\sqrt{15}}{3} = \frac{6}{3} - \frac{2\sqrt{15}}{3} = 2 - \frac{2\sqrt{15}}{3}$$

$$16. (5 - 3\sqrt{3})(3 + \sqrt{3}) \quad -9$$

$$15 + 5\sqrt{3} - 9\sqrt{3} - 3\sqrt{9}$$

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

Solve the following equations.

Try to get $\sqrt{\quad}$ by itself, then square.

17. $5 = \sqrt{9r} + 2$

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

$$9 = 9r \quad r = 1$$

18. $\sqrt{3a - 17} = 2$

$$3a - 17 = 4$$

$$3a = 21$$

$$a = 7$$

19. $9a^2 + 4 = 40$

$$9a^2 = 36$$

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

$$a = \pm 2$$

20. $72 = 8\sqrt{3p}$

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

$$81 = 3p$$

$$27 = p$$

Rationalize the denominator.

multiply by conjugate

21. $\frac{3}{4\sqrt{5} - \sqrt{3}} \cdot \frac{4\sqrt{5} + \sqrt{3}}{4\sqrt{5} + \sqrt{3}}$

$$\frac{12\sqrt{5} + 3\sqrt{3}}{80 - 3} = \frac{12\sqrt{5} + 3\sqrt{3}}{77}$$

22. $\frac{3}{-2 + 5\sqrt{5}} \cdot \frac{-2 - 5\sqrt{5}}{-2 - 5\sqrt{5}}$

$$\frac{-6 - 15\sqrt{5}}{4 - 125} = \frac{-6 - 15\sqrt{5}}{-121} = \frac{6 + 15\sqrt{5}}{121}$$

on top distribute

Find the distance between the given points. Round your answer to the nearest tenth.

reduce if you can

23. $(6, -5), (-3, 1)$

$$\sqrt{(6+3)^2 + (-5-1)^2} = \sqrt{117}$$

$$\sqrt{9^2 + (-6)^2} \approx 10.8$$

$$\sqrt{81 + 36}$$

24. $(-1, -1), (-4, 7)$

$$\sqrt{(-1+4)^2 + (-1-7)^2} = \sqrt{73}$$

$$\sqrt{3^2 + (-8)^2} \approx 8.5$$

$$\sqrt{9 + 64}$$

Be prepared to solve word problems.

25. When 9 is added to 4 times the square of a number, the result is 33. Find the number.

$$9 + 4x^2 = 33$$

$$4x^2 = 24$$

$$x^2 = 6$$

$$x = \pm\sqrt{6} \approx \pm 2.4$$

26. When 2 is subtracted from the square root of a number, the result is 1. Find the number.

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

$$\sqrt{x} = 3$$

$$x = 9$$