Getting Ready for Algebra II - Radicals

I. Express in simplest form. Assume all variables represent positive real numbers.

1. $\sqrt{24} \cdot \sqrt{10}$ $4\sqrt{15}$ $\sqrt{4 \cdot 6 \cdot 2 \cdot 5}$

2. $\sqrt{5} \cdot \sqrt{63} \cdot \sqrt{5}$ $15\sqrt{7}$ $5\sqrt{9 \cdot 7}$

3. $\sqrt{\frac{20}{7}} \cdot \sqrt{\frac{14}{25}}$ $\frac{2\sqrt{10}}{5}$ $\sqrt{\frac{20}{7} \cdot \frac{14}{25}} = \sqrt{4 \cdot \frac{2}{5}} = 2\frac{\sqrt{2}}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \boxed{\frac{2\sqrt{10}}{5}}$

4. $\sqrt{2\frac{1}{2}} \cdot \sqrt{1\frac{3}{8}}$ $\frac{\sqrt{55}}{4}$

5. $\sqrt{\frac{7}{12}} \cdot \sqrt{\frac{48}{49}}$ $\frac{2\sqrt{7}}{7}$ $\frac{2}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}} = \frac{2\sqrt{7}}{7}$

6. $\sqrt{\frac{3}{5}}$ $\frac{\sqrt{15}}{5}$ $\frac{\sqrt{3}}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{15}}{5}$

7. $\sqrt{\frac{5}{8}}$ $\frac{\sqrt{10}}{4}$ $\frac{\sqrt{5}}{2\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{10}}{4}$

8. $\sqrt{27x^4y^8}$ $3x^2y^4\sqrt{3}$ $3x^2y^4\sqrt{3}$

9. $4\sqrt{150x^8y^7}$ $20x^4y^3\sqrt{6y}$

10. $\sqrt{\frac{16c^{10}}{81d^{12}}}$ $\frac{4c^5}{9d^6}$

11. $\sqrt{x^2+14x+49}$ $(x+7)$

12. $\sqrt{4x^2-12x+9}$ $2x-3$

13. $\sqrt{x^2-10x+25}$ $x-5$

II. Simplify

14. $5\sqrt{96}$ $20\sqrt{6}$

15. $7\sqrt{288}$ $84\sqrt{2}$

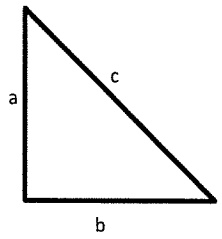
16. $9\sqrt{800}$ $180\sqrt{2}$

III. Solve!!!!!!

17. $25x^2 = 144$ $x = \pm\frac{12}{5}$

18. $36y^2 - 49 = 0$ $y = \frac{7}{6}$ or $-\frac{7}{6}$

IV. Refer to the right triangle shown below. Find the missing length correct to the nearest hundredth.



19. a = 13, b = 9, c = 15.81 $13^2 + 9^2 = c^2$

20. a = 13.00 b = 11, c = 17 $a^2 + 11^2 = 17^2$

21. State whether or not the three given numbers could represent the lengths of the sides of a right triangle.

17, 34, 39 $17^2 + 34^2 \stackrel{?}{=} 39^2$

$1445 \neq 1521$ NO

22. Find the length of each diagonal of a rectangle whose dimensions are 5 cm by 8 cm.

$5^2 + 8^2 = d^2$

$d = \sqrt{89} \approx 9.43$

V. Find the distance.

23. (- 2, 1) (- 8, - 5)

$d = \sqrt{(-2+8)^2 + (1+5)^2}$

$\sqrt{36+36}$

$= 6\sqrt{2} \approx 8.49$

24. $(6\sqrt{3}, 8)$ $(9\sqrt{3}, 10)$

$d = \sqrt{(9\sqrt{3} - 6\sqrt{3})^2 + (10-8)^2}$

$= \sqrt{(3 \cdot 3) + 4}$

$\sqrt{31} \approx 5.57$

Find the value of a.

25. (- 5, 4) (a, - 2) Distance is 10.

$10 = \sqrt{(-5-a)^2 + (4+2)^2}$

$100 = a^2 + 10a + 25 + 36$

$0 = a^2 + 10a - 39$

$0 = (a+13)(a-3)$

$a = -13$ $a = 3$

26. (3, 4) (9, a) Distance is $2\sqrt{10}$

$2\sqrt{10} = \sqrt{(9-3)^2 + (a-4)^2}$

$40 = 36 + a^2 - 8a + 16$

$0 = a^2 - 8a + 12$

$0 = (a-6)(a-2)$

$a = 6$ or $a = 2$