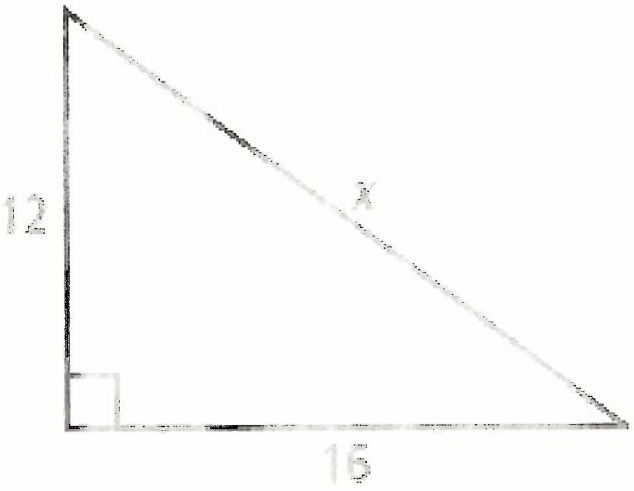
Find the missing length. Show your work!!

1.



$12^2 + 16^2 = x^2$

$144 + 256 = x^2$

$\sqrt{400 = x^2}$

$x = 20$

Find the missing length. Show your work!!

2.

$10^2 + x^2 = 26^2$

$100 + x^2 = 676$

$-100 \quad -100$

$\sqrt{x^2 = 576}$

$x = 24$

3. Could the lengths 18 in., 80 in., and 82 in. be the side lengths of a right triangle? Explain.

$18^2 + 80^2 = 82^2$

$324 + 6400 = 6724$

$6724 = 6724$

Yes!

Simplify the expression. Show your work!!

4. $8\sqrt{6} - 3\sqrt{6}$

$5\sqrt{6}$

Simplify the expression. Show your work!!

5. $\frac{1}{3}\sqrt{7} + \frac{2}{3}\sqrt{7}$

$1\sqrt{7} = \sqrt{7}$

Simplify the expression. Show your work!!

6. $4\sqrt{11} - 7\sqrt{11}$

$-3\sqrt{11}$

Simplify the expression. Show your work!!

7. $\sqrt{243}$

$\sqrt{81}\sqrt{3}$

$9\sqrt{3}$

Simplify the expression. Show your work!!

8. $\sqrt{25c^2}$

$5c$

Simplify the expression. Show your work!!

9. $(\sqrt{25})^2$ 25

Simplify the expression. Show your work!!

10. $\sqrt{32}$ $\sqrt{16}\sqrt{2}$

$4\sqrt{2}$

Simplify the expression. Show your work!!

11. $\sqrt{128}$ $\sqrt{64}\sqrt{2}$

$8\sqrt{2}$

Simplify the expression. Show your work!!

12. $\sqrt{300}$ $\sqrt{100}\sqrt{3}$

$10\sqrt{3}$

Simplify the expression. Show your work!!

13. $\sqrt{50} + \sqrt{8}$ $\sqrt{25}\sqrt{2} + \sqrt{4}\sqrt{2}$

$5\sqrt{2} + 2\sqrt{2}$

$7\sqrt{2}$

Simplify the expression. Show your work!!

14. $4\sqrt{3} + \sqrt{27}$

$\sqrt{9}\sqrt{3}$

$4\sqrt{3} + 3\sqrt{3} = 7\sqrt{3}$

Simplify the expression. Show your work!!

15. $\sqrt{8} - \sqrt{2}$

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

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

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

Simplify the expression. Show your work!!

16. $\frac{5}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}} = \frac{5\sqrt{7}}{7}$

Simplify the expression. Show your work!!

17. $\frac{\sqrt{120}}{\sqrt{6}} = \sqrt{\frac{120}{6}} = \sqrt{20} = \sqrt{4}\sqrt{5} = 2\sqrt{5}$

Simplify the expression. Show your work!!

18. $\frac{-5\sqrt{3}}{\sqrt{12}} = \frac{-5\sqrt{3}}{\sqrt{12}} = -5\sqrt{\frac{1}{4}} = \frac{-5\sqrt{1}}{\sqrt{4}} = \frac{-5}{2} = -2.5$

Simplify the expression. Show your work!!

19. $\sqrt{3}(\sqrt{12}+4) = \sqrt{36} + 4\sqrt{3}$

$6 + 4\sqrt{3}$

Simplify the expression. Show your work!!

20. $\sqrt{8}(\sqrt{3}+3)$

$\sqrt{24} + 3\sqrt{8}$

$\sqrt{4}\sqrt{6} + 3\sqrt{4}\sqrt{2}$

$2\sqrt{6} + 3 \cdot 2\sqrt{2}$

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

Simplify the expression. Show your work!!

21. $\sqrt{7}(\sqrt{7}-2)$

$\sqrt{49} - 2\sqrt{7} = 7 - 2\sqrt{7}$

Simplify the expression. Show your work!

22. $(2\sqrt{3}+\sqrt{5})(6\sqrt{5}-4\sqrt{3})$

	$2\sqrt{3}+\sqrt{5}$
$6\sqrt{5}$	$12\sqrt{15}$ | $6\sqrt{25}=30$
$-4\sqrt{3}$	$-8\sqrt{9}=-24$ | $-4\sqrt{15}$

$= 8\sqrt{15}+6$

Simplify the expression. Show your work!!

23. $(7+3\sqrt{5})(7-3\sqrt{5})$

$49-9\sqrt{25}$

$49-9\cdot 5=$

4

Level 4-Simplify the expression. Show your work!!

24. $\dfrac{7\sqrt{5}}{3+\sqrt{2}}\ \dfrac{(3-\sqrt{2})}{(3-\sqrt{2})} = \dfrac{21\sqrt{5}-7\sqrt{10}}{9-2} =$

$\dfrac{7(3\sqrt{5}-\sqrt{10})}{7} = 3\sqrt{5}-\sqrt{10}$

Level 4-Simplify the expression. Show your work

25. $\dfrac{5}{\sqrt{7}+2}\ \dfrac{(\sqrt{7}-2)}{(\sqrt{7}+-2)} = \dfrac{5\sqrt{7}-10}{7-4} =$

$\dfrac{5\sqrt{7}-10}{3}$

Level 4-Simplify the expression. Show your work

26. $\frac{1}{\sqrt{7}-\sqrt{3}} \cdot \frac{(\sqrt{7}+\sqrt{3})}{(\sqrt{7}+\sqrt{3})} = \frac{\sqrt{7}+\sqrt{3}}{7-3} = \frac{\sqrt{7}+\sqrt{3}}{4}$

Solve the radical equation. Show your work and check your answer!

27. $\sqrt{3x} + 10 = 16$

$-10 \quad -10$

$\sqrt{3x}^2 = 6^2$

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

$x = 12$

Solve the radical equation. Show your work and check your answer!

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

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

$r+5 = 4r-4$

$-r \quad -r$

$5 = 3r - 4$

$+4 \quad +4$

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

$r = 3$

Solve the radical equation. Show your work and check your answer!

29. $\sqrt{2x-1}^2 = x^2$

$2x - 1 = x^2$

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

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

$(x-1)(x-1)$

$x = 1$

Solve the radical equation. Show your work and check your answer!

30. $\sqrt{x-3}^{2} = \sqrt{x+5}^{2}$

$x - 3 = x + 5$

$-x \quad\quad -x$

$-3 = 5$

NO Solution

Solve the radical equation. Show your work and check your answer!

31. $\sqrt{5n-4}^{2} = 6^{2}$

$5n - 4 = 36$

$+4 \quad\quad +4$

$\frac{5n}{5} = \frac{40}{5}$

$n = 8$

Solve the radical equation. Show your work and check your answer!

32. $\sqrt{\frac{a}{2} - 3}^{2} = (-32)^{2}$

Don't do all of this work!!

NO Solution!

$\frac{a}{2} - 3 = 1024$

$+3 \quad\quad +3$

$2 \cdot \frac{a}{2} = 1027 \cdot 2$

$a = 2054$

Solve the radical equation. Show your work and check your answer!

33. $\sqrt{2x^2+17}^{\,2} = \sqrt{(x+3)^2}^{\,2}$

$2x^2+17 = (x+3)^2$

$2x^2+17 = x^2+6x+9$

$-x^2-6x-9 \quad -x^2-6x-9$

$x^2-6x+8 = 0$

$(x-4)(x-2) = 0$

$x=4$ or $x=2$

Solve the radical equation. Show your work and check your answer!

34. $h^2 = \sqrt{-13h-42}^{\,2}$

$h^2 = -13h-42$

$+13h+42 \quad +13h \quad +42$

$h^2+13h+42 = 0$

$(h+6)(h+7) = 0$

~~$h=-6$~~ ~~$h=-7$~~

No Solution

35. Two sides of a right triangle are 8 and 12 in.

a. Find the missing side if these are the lengths of the legs.

$8^2+12^2 = c^2$

$64+144 = c^2$

$\sqrt{208} = c^2$

$c = 14.42$ in

b. Find the missing side if these are the lengths of a leg and hypotenuse.

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

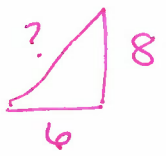
$a^2+64 = 144$

$-64 \quad -64$

$\sqrt{a^2} = \sqrt{80}$

$b = 8.94$

36. The foot of a ladder is placed 6 feet from a wall. If the top of the ladder rests 8 feet up on the wall, how long is the ladder?



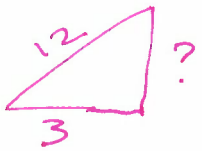
$6^2 + 8^2 = c^2$

$36 + 64 = c^2$

$\sqrt{100} = c^2$

$c = 10$ feet

37. The bottom of a ladder must be placed 3 ft. from a wall. The ladder is 12 feet long. How far above the ground does the ladder touch the wall?



$3^2 + b^2 = 12^2$

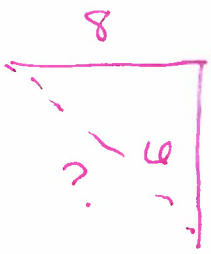
$9 + b^2 = 144$

$-9 \quad -9$

$\sqrt{b^2} = \sqrt{135}$

$b = 11.62$ feet

38. John leaves school to go home. He walks 6 blocks North and then 8 blocks west. How far is John from the school?



$6^2 + 8^2 = c^2$

$36 + 64 = c^2$

$\sqrt{100} = c^2$

$c = 10$ blocks