Simplify by combining like terms.

35. $a\sqrt{27} - 2\sqrt{3a^2}$

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

$a\sqrt{3}$

36. $5\sqrt{2y^2} - 3y\sqrt{8}$

$5y\sqrt{2} - 6y\sqrt{2}$

$-y\sqrt{2}$

37. $5\sqrt{3x^3} + 2\sqrt{27x}$

$5x\sqrt{3x} + 6\sqrt{3x}$

38. $7\sqrt{2a^3} - \sqrt{8a}$

$7a\sqrt{2a} - 2\sqrt{2a}$

Simplify by combining like terms.

1. $2\sqrt{2} + 4\sqrt{2}$

$6\sqrt{2}$

2. $\sqrt{3} + 5\sqrt{3}$

$6\sqrt{3}$

3. $11\sqrt{7} - 4\sqrt{7}$

$7\sqrt{7}$

4. $5\sqrt{3} - 3\sqrt{2}$

$2\sqrt{2}$

5. $5\sqrt{7} + 3\sqrt{6}$

$5\sqrt{7} + 3\sqrt{6}$

6. $3\sqrt{5} - 5\sqrt{5}$

$-2\sqrt{5}$

7. $2\sqrt{3} - 5\sqrt{3}$

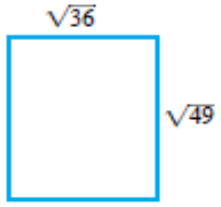
$-3\sqrt{3}$

8. $2\sqrt{11} + 5\sqrt{11}$

$7\sqrt{11}$

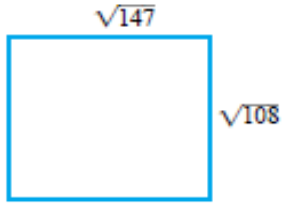
Applications of target 11.2

47. Perimeter of a rectangle. Find the perimeter of the rectangle shown in the figure.



$2\sqrt{36}+2\sqrt{49}$
$2(6)+2(7)$
$12+14=26$

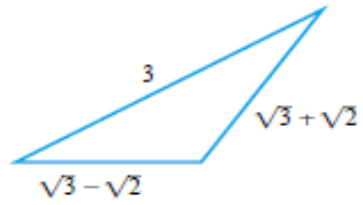
48. Perimeter of a rectangle. Find the perimeter of the rectangle shown in the figure. Write your answer in radical form.



$147 = 3 \cdot 49$ $\quad 108 = 3 \cdot 36$

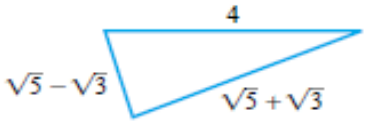
$2\sqrt{147}+2\sqrt{108}$
$14\sqrt{3}+12\sqrt{3}$
$26\sqrt{3}$

49. Perimeter of a triangle. Find the perimeter of the triangle shown in the figure.



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

50. Perimeter of a triangle. Find the perimeter of the triangle shown in the figure.



$4+\sqrt{5}-\sqrt{3}+\sqrt{5}+\sqrt{3}$
$4+2\sqrt{5}$

11.2-11.3

Target 11.3 (part 1)- I can Mult. expressions containing radicals

Things to know:

$\sqrt{ab} = \sqrt{a} \cdot \sqrt{b}$ $\qquad$ $\sqrt{a} \cdot \sqrt{b} = \sqrt{ab}$

Example 1

Simplifying Radical Expressions

Multiply then simplify each expression.

(a) $\sqrt{5} \cdot \sqrt{10} = \sqrt{50} = 5\sqrt{2}$

(b) $\sqrt{12} \cdot \sqrt{6} = \sqrt{72} = 6\sqrt{2}$

(c) $\sqrt{10x} \cdot \sqrt{2x} = \sqrt{20x^2} = 2x\sqrt{5}$

CHECK YOURSELF 1

Simplify.

(a) $\sqrt{3} \cdot \sqrt{6}$ $\qquad$ (b) $\sqrt{3} \cdot \sqrt{18}$ $\qquad$ (c) $\sqrt{8a} \cdot \sqrt{3a}$

$2\sqrt{3}$ $\qquad$ $3\sqrt{6}$ $\qquad$ $2a\sqrt{6}$

Example 2

Multiplying Radical Expressions

Multiply.

$(2\sqrt{5})(3\sqrt{6}) = 6\sqrt{30}$

CHECK YOURSELF 2

Multiply $(3\sqrt{7})(5\sqrt{3})$. $15\sqrt{21}$

Example 3

Multiplying Radical Expressions

Multiply.

(a) $\sqrt{3}(\sqrt{2} + \sqrt{3})$ $\qquad$ (b) $\sqrt{5}(2\sqrt{6} + 3\sqrt{3})$

$\sqrt{6} + 3$ $\qquad$ $2\sqrt{30} + 3\sqrt{15}$

CHECK YOURSELF 3

Multiply.

(a) $\sqrt{5}(\sqrt{6} + \sqrt{5})$ $\qquad$ (b) $\sqrt{3}(2\sqrt{5} + 3\sqrt{2})$

$\sqrt{30} + 5$ $\qquad$ $2\sqrt{15} + 3\sqrt{6}$

Example 4

Multiplying Radical Expressions

Multiply.

(a) $(\sqrt{3} + 2)(\sqrt{3} + 5)$

$\sqrt{3}\sqrt{3}+5\sqrt{3}+2\sqrt{3}+10$

$3+7\sqrt{3}+10$

$13+7\sqrt{3}$

(b) $(\sqrt{7} + 2)(\sqrt{7} - 2)$

$7-2\sqrt{7}+2\sqrt{7}-4$

3

(c) $(\sqrt{3} + 5)^2 =$

$3+10\sqrt{5}+25$

CHECK YOURSELF 4

Multiply.

(a) $(\sqrt{5} + 3)(\sqrt{5} - 2)$

$5+\sqrt{5}-6$

$-1+\sqrt{5}$

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

-13

(c) $(\sqrt{2} - 3)^2$

$2-6\sqrt{2}+9$

15. $\sqrt{18} \cdot \sqrt{6}$

18 6
2 9 2 3

$12\sqrt{3}$

16. $\sqrt{8} \cdot \sqrt{10}$

8 10
2 4 2 5

$4\sqrt{5}$

17. $\sqrt{2x} \cdot \sqrt{6x}$

$2x\sqrt{3}$

18. $\sqrt{3a} \cdot \sqrt{15a}$

$3a\sqrt{5}$

19. $2\sqrt{3} \cdot \sqrt{7}$

$2\sqrt{21}$

20. $3\sqrt{2} \cdot \sqrt{5}$

$3\sqrt{10}$

21. $(3\sqrt{3})(5\sqrt{7})$

$15\sqrt{21}$

22. $(2\sqrt{5})(3\sqrt{11})$

$6\sqrt{55}$

23. $(3\sqrt{5})(2\sqrt{10})$

$6\sqrt{50}$
$30\sqrt{2}$

24. $(4\sqrt{3})(3\sqrt{6})$

$36\sqrt{2}$

25. $\sqrt{5}(\sqrt{2} + \sqrt{5})$

$\sqrt{10} + \sqrt{25}$

26. $\sqrt{3}(\sqrt{5} - \sqrt{3})$

$\sqrt{15} - 3$

27. $\sqrt{3}(2\sqrt{5} - 3\sqrt{3})$

$2\sqrt{15} - 9$

28. $\sqrt{7}(2\sqrt{3} + 3\sqrt{7})$

$2\sqrt{21} + 21$

29. $(\sqrt{3} + 5)(\sqrt{3} + 3)$

$3 + 5\sqrt{3} + 3\sqrt{3} + 15$
$18 + 8\sqrt{3}$

30. $(\sqrt{5} - 2)(\sqrt{5} - 1)$

$5 - 2\sqrt{5} - \sqrt{5} + 2$
$7 - 3\sqrt{5}$

31. $(\sqrt{5} - 1)(\sqrt{5} + 3)$

$5 + 3\sqrt{5} - \sqrt{5} - 3$
$2 + 2\sqrt{5}$

32. $(\sqrt{2} + 3)(\sqrt{2} - 7)$

$2 + 3\sqrt{2} - 7\sqrt{2} - 21$
$-19 - 4\sqrt{2}$

33. $(\sqrt{5} - 2)(\sqrt{5} + 2)$

$5 - 4$
1

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

$7 - 25$
-18

35. $(\sqrt{10} + 5)(\sqrt{10} - 5)$

36. $(\sqrt{11} - 3)(\sqrt{11} + 3)$