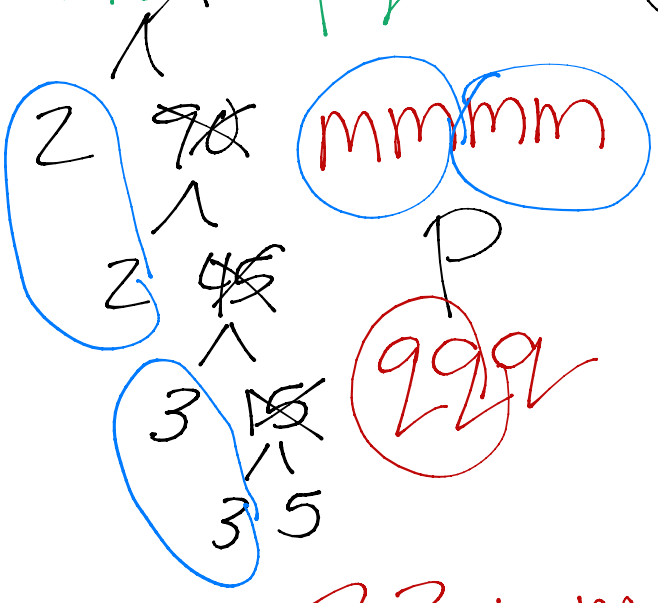
Warmup

Simplify

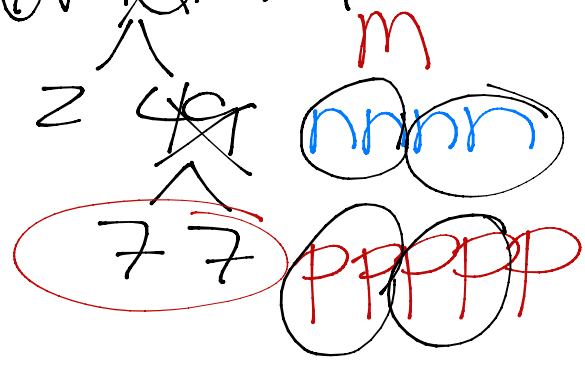
① $\sqrt{180m^4pq^3}$



$2 \cdot 3 \cdot m \cdot m \cdot q\sqrt{5pq}$

$6m^2q\sqrt{5pq}$

② $-6\sqrt{98mn^4p^5}$



$-6 \cdot 7 \cdot n \cdot n \cdot p \cdot p\sqrt{2mp}$

$-42n^2p^2\sqrt{2mp}$

Adding and Subtracting Radicals NOTES

You can only combine like terms which means that you can ONLY combine like RADICANDS (inside term).

same Radical

1. If the radicands are alike, you add or subtract the outside terms and keep the radicand (inside) term the same.

2. If the radicands are not alike, you must FIRST try to simplify them to see if they will become alike.

3. ALWAYS make sure the radicand is simplified in the end.

1) $2\sqrt{2}+3\sqrt{2}$

$5\sqrt{2}$

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

$-5\sqrt{6}$

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

$-3\sqrt{5}$

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

$2\sqrt{6}$

5) $\sqrt{2}+\sqrt{8}$

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

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

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

7) $\sqrt{6}+\sqrt{6}$

$2\sqrt{6}$

8) $\sqrt{25}+\sqrt{50}$

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

9) $-2\sqrt{24}-\sqrt{54}$

$-2\cdot2\sqrt{2\cdot3}$

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

$-7\sqrt{6}$

10) $3\sqrt{6}+3\sqrt{24}$

11) $-3\sqrt{27}-3\sqrt{27}$

have → to simplify

$-6\sqrt{27}$

$-6\cdot3\sqrt{3}$

$-18\sqrt{3}$

12) $2\sqrt{5}+2\sqrt{45}$

13) $2\sqrt{20}-\sqrt{18}-\sqrt{5}$

14) $-\sqrt{5}+3\sqrt{6}-\sqrt{5}$

15) Justin and Rebecca worked together to solve $\sqrt{45} + 2\sqrt{30}$. Their answer was $5\sqrt{5}$. Are they correct? If not, explain and correct their mistake below.

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

$3\sqrt{5} + 4\sqrt{5} = 7\sqrt{5}$

They forgot to multiply by 2 in original problem

Operations on Radicals

Must have like radicands

Find the perimeter of the triangle

$4\sqrt{3}$

$2\sqrt{147}$ $14\sqrt{3}$

$6\sqrt{12}$ $12\sqrt{3}$

$3\sqrt{75}$ $15\sqrt{3}$

$3\sqrt{15}$

$4\sqrt{10}$

Find the area of the rectangle. $60\sqrt{6}$

Multiply: radicands • radicands, coefficients • coefficients

low

$(4\sqrt{10})(3\sqrt{15}) = 12\sqrt{150}$

Find the area of the rectangle. $16\sqrt{3} + 24$

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

$4\sqrt{2}$

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

$12\sqrt{4} + 8\sqrt{12} =$

12 2nd x^2 $4 \rightarrow + 8$ 2nd x^2 12 enter

16. The length of a rectangle is $7\sqrt{6}$. The width is $2\sqrt{6}$. Find the perimeter of the rectangle.

ADD

$7\sqrt{6}$, $2\sqrt{6}$, $2\sqrt{6}$, $7\sqrt{6}$

$18\sqrt{6}$

17. The perimeter of a rectangle is $14\sqrt{3}$. The width is $3\sqrt{3}$. Find the length of the rectangle.

$3\sqrt{3}$, $4\sqrt{3}$, $14\sqrt{3}$, $3\sqrt{3}$

$14\sqrt{3} - 6\sqrt{3} = \frac{8\sqrt{3}}{2}$

18. The length of a rectangle is $3\sqrt{8}$. The width is $4\sqrt{2}$. Find the perimeter of the rectangle.

$3\sqrt{8}$, $4\sqrt{2}$, $4\sqrt{2}$, $3\sqrt{8}$

$8\sqrt{2} + 6\sqrt{8}$

$20\sqrt{2}$

19. The perimeter of a rectangle is $10\sqrt{12}$. The width is $4\sqrt{3}$. Find the length of the rectangle.

$4\sqrt{3}$, $10\sqrt{12}$, $4\sqrt{3}$

$10\sqrt{12} - 8\sqrt{3} = \frac{12\sqrt{3}}{2}$

$6\sqrt{3}$

Name

① $\sqrt{40} + \sqrt{20} - 3\sqrt{3}$ (all work)

② $4\sqrt{7}(2\sqrt{7} + \sqrt{3})$