Expand a Single Bracket Containing a Surd

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1. Expand and simplify.

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

b) $\sqrt{7}(5 + \sqrt{5})$

c) $\sqrt{6}(4 - \sqrt{5})$

d) $\sqrt{11}(\sqrt{11} - 4)$

e) $\sqrt{2}(\sqrt{3} - \sqrt{8})$

2. Expand and fully simplify.

a) $\sqrt{12}(\sqrt{3} + 2) + 4$

b) $6 + \sqrt{7}(7 + \sqrt{7})$
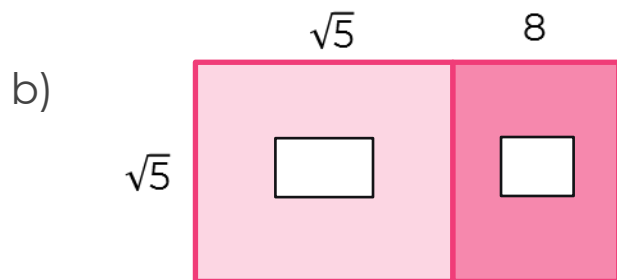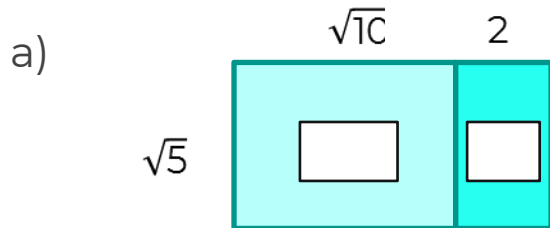
c) $\sqrt{8}(4 - \sqrt{2}) - 10$

d) $\sqrt{10}(\sqrt{5} - 4) + 2\sqrt{2}$

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

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3. Describe the area of each rectangle in expanded form. All measurements are in centimetres.

a)

b)

4. Mark is attempting to expand and simplify $\sqrt{2}(\sqrt{10} - 2)$

Here is his working.

$$\sqrt{2}(\sqrt{10} - 2) = \sqrt{20} - 2$$

a) What mistakes has Mark made?

b) What is the correct answer?

Answers

Expand a single bracket

1. Expand and simplify.

a) $\sqrt{5}(\sqrt{3} + 2) = \sqrt{15} + 2\sqrt{5}$

b) $\sqrt{7}(5 + \sqrt{5}) = 5\sqrt{7} + \sqrt{35}$

c) $\sqrt{6}(4 - \sqrt{5}) = 4\sqrt{6} - \sqrt{30}$

d) $\sqrt{11}(\sqrt{11} - 4) = 11 - 4\sqrt{11}$

e) $\sqrt{2}(\sqrt{3} - \sqrt{8}) = \sqrt{6} - 4$

2. Expand and fully simplify.

a) $\sqrt{12}(\sqrt{3} + 2) + 4 = 10 + 4\sqrt{3}$

b) $6 + \sqrt{7}(7 + \sqrt{7}) = 13 + 7\sqrt{7}$
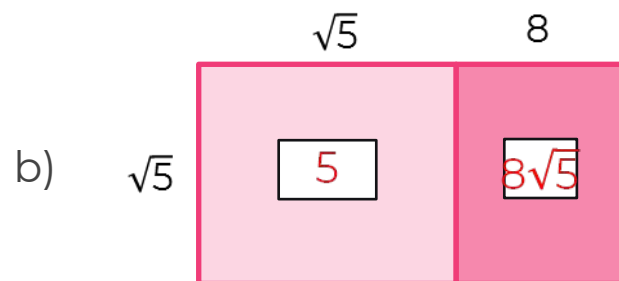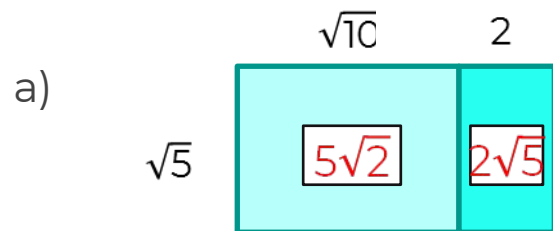
c) $\sqrt{8}(4 - \sqrt{2}) - 10 = -14 + 8\sqrt{2}$

d) $\sqrt{10}(\sqrt{5} - 4) + 2\sqrt{2} = 7\sqrt{2} - 4\sqrt{10}$

e) $\sqrt{6}(\sqrt{6} - \sqrt{2}) - \sqrt{3} = 6 - 3\sqrt{3}$

Expand a single bracket

3. Use the rectangles to describe each area in an expanded form. All measurements are in centimetres.

a)

b)

4. Mark is attempting to expand and simplify $\sqrt{2}(\sqrt{10}-2)$

Here is his working out.

$$\sqrt{2}(\sqrt{10} - 2) = \sqrt{20} - 2$$

What mistakes has Mark made?

He has not simplified $\sqrt{20}$ and has not multiplied $\sqrt{2}$ by the negative 2.

What is the correct answer?