Exam Style Questions

1) Express $(5 + \sqrt{3})^2$ in the form $a + b\sqrt{c}$

2) Rationalise the denominator $\dfrac{14}{\sqrt{2}}$ and simplify

3) Evaluate $(4 + \sqrt{7})(4 - \sqrt{7})$

4) Given that $a = \sqrt{2}, \ b = \sqrt{10}, c = \sqrt{40}$, simplify the following

    a. $\dfrac{\sqrt{b}\sqrt{c}}{\sqrt{a}}$

    b. $\dfrac{\sqrt{a}\sqrt{b}}{\sqrt{c}}$

    c. abc

5) Simplify $(4 + \sqrt{3})^2 - (4 - \sqrt{3})^2$

6) Simplify the following $\sqrt{50} + \sqrt{18} + \dfrac{10}{\sqrt{2}}$

7) Rationalise the denominator and simplify $\dfrac{(5 + \sqrt{5})}{(6 + \sqrt{5})}$

8) Rationalise the denominator and simplify $\dfrac{(2 - \sqrt{2})}{(\sqrt{2} + 1)}$

9) Evaluate $(4 + \sqrt{12})(9 - \sqrt{18})$

10) Simplify $\sqrt{125} - \sqrt{45} + \sqrt{20}$

11) The radius of a circle is $(6 + \sqrt{7})$.

    a. What is the perimeter of the circle? Write your answer in its simplest form.

    b. What is the area of the circle? Write your answer in terms of π and its simplest form

12) A rectangular piece of paper has an area of $(36 + \sqrt{2} + 6\sqrt{3} + 2\sqrt{6})$. One side of the paper is $(18 + \sqrt{6})$. What is the size of the other side?

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Answers

1) $28 + 10\sqrt{3}$

2) $7\sqrt{2}$
3) -3
4)
    a. $10\sqrt{2}$

    b. $\dfrac{\sqrt{2}}{2}$

    c. $20\sqrt{2}$

5) $16\sqrt{3}$
6) $13\sqrt{2}$

7) $\dfrac{(25 + \sqrt{5}}{31}$

8) $6\sqrt{2} - 7$
9) $36 - 12\sqrt{2} + 18\sqrt{3} - 6\sqrt{6}$
10) $4\sqrt{5}$
11)
    a. $12\pi + 2\pi\sqrt{7}$

    b. $43\pi + 12\pi\sqrt{7}$

12) $2 + \dfrac{\sqrt{3}}{3}$