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(1) Simplify each

$\sqrt{20}$ $\sqrt{18}$ $\sqrt{75}$ $\sqrt{200}$ $\sqrt{32}$ $\sqrt{p^2}$

(2) Write each in the form $\sqrt{N}$

$3\sqrt{5}$ $2\sqrt{2}$ $5\sqrt{2}$ $a\sqrt{b}$ $t^2\sqrt{t}$ $7\sqrt{2}$

(3) Simplify each

$\sqrt{2}\times\sqrt{3}$ $\sqrt{6}\times 4\sqrt{3}$ $2\sqrt{5}\times 4\sqrt{10}$ $\sqrt{a}\times\sqrt{a}$

(4) Expand and simply each

$\sqrt{2}(\sqrt{2}+1)$ $\sqrt{6}(\sqrt{2}-2)$ $2\sqrt{3}(\sqrt{3}-\sqrt{6})$ $\sqrt{a}(\sqrt{a}+b)$ $5\sqrt{7}(5-\sqrt{7})$

(5) Expand and simply each

$(\sqrt{5}+2)(\sqrt{5}+6)$ $(\sqrt{6}-4)(2\sqrt{6}+1)$ $(\sqrt{5}-6)(\sqrt{10}+6)$ $(\sqrt{a}+2)(\sqrt{a}+6)$ $(\sqrt{b}+2)(\sqrt{a}+6)$

(6) Simplify each

$\frac{\sqrt{20}}{\sqrt{5}}$ $\sqrt{\frac{27}{9}}$ $\frac{2\sqrt{2}}{\sqrt{8}}$ $\sqrt{2\frac{2}{9}}$ $\sqrt{\frac{a^2}{a}}$

(7) Simplify each, if possible

$\sqrt{3}+2\sqrt{3}$ $5\sqrt{2}+3\sqrt{2}$ $\sqrt{50}-\sqrt{2}$ $2\sqrt{3}+\sqrt{75}$ $5\sqrt{8}-\sqrt{2}$ $10\sqrt{6}+\sqrt{2}$

(8) Rationalise the denominator for each simplify your answer fully where possible

$\frac{2}{\sqrt{5}}$ $\frac{8}{\sqrt{2}}$ $\frac{7}{3\sqrt{5}}$ $\frac{a}{\sqrt{a}}$ $\frac{1+\sqrt{7}}{\sqrt{2}}$ $\frac{10-\sqrt{5}}{\sqrt{5}}$

(9) Rationalise the denominator for each simplify your answer fully where possible

$\frac{2}{3+\sqrt{5}}$ $\frac{3}{4-\sqrt{3}}$ $\frac{2+\sqrt{3}}{7+\sqrt{3}}$ $\frac{\sqrt{3}}{\sqrt{2}-\sqrt{3}}$ $\frac{1-\sqrt{3}}{1+\sqrt{3}}$ $\frac{\sqrt{2}-\sqrt{3}}{\sqrt{6}+\sqrt{3}}$

(10) Write $(2\sqrt{3}-1)(3\sqrt{6}+1)$ in the form $A\sqrt{2}+B\sqrt{3}+C\sqrt{6}+D$

(11) The area of the rectangle below is $(7+7\sqrt{2})$. One side length is $(\sqrt{2}+3)$.
(a) Find the exact value of the other side length,
(b) Find the perimeter of the rectangle in exact form, simplifying your answer.

(12) Solve the equation $x\sqrt{3}-1=2x-\sqrt{6}$ giving your answer in the form $x=A\sqrt{2}+B\sqrt{3}+C\sqrt{6}+D$

(13) Given that $(a+\sqrt{b})^2\equiv 10(3+\sqrt{5})$ find the values of $a$ and $b$.

(14) The diagram below shows a right-angled triangle. Show that the perimeter of the triangle can be written in the form $a+b\sqrt{19}$ where $a$ and $b$ are integers to be found.