Professor Katiraie MA103 Quiz 7 (20 Pts)

Name Solution

1. Perform the indicated operations. Simplify your answers.

a. $(3-5\sqrt{7})(4+4\sqrt{7})$

$= 12 + 12\sqrt{7} - 20\sqrt{7} - 20(7)$

$= 12 - 8\sqrt{7} - 140$

$= \boxed{-128 - 8\sqrt{7}}$

b. $3\sqrt{20} - 5\sqrt{5} + \sqrt{45}$ Hint: change to like radicals.

$= 3\sqrt{4}\sqrt{5} - 5\sqrt{5} + \sqrt{9}\sqrt{5}$

$= 6\sqrt{5} - 5\sqrt{5} + 3\sqrt{5}$

$= \boxed{4\sqrt{5}}$

c) $(3+2\sqrt{3})(4-3\sqrt{3})$

$12 - 9\sqrt{3} + 8\sqrt{3} - 6(3)$

$= 12 - 1\sqrt{3} - 18 = \boxed{-6 - 1\sqrt{3}}$ OR $\boxed{-6 - \sqrt{3}}$

d). $(3+5\sqrt{7})(4+4\sqrt{7})$

$12 + 12\sqrt{7} + 20\sqrt{7} + 20(7)$

$= 12 + 32\sqrt{7} + 140 = \boxed{152 + 32\sqrt{7}}$

e. $(5-4\sqrt{3})(5+4\sqrt{3})$

$= 25 + 20\sqrt{3} - 20\sqrt{3} - 16(3)$

$= 25 - 48 = \boxed{-23}$

2. Simplify

a. $\sqrt{48} = \sqrt{16}\sqrt{3} = 4\sqrt{3}$

b. $\frac{4}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{4\sqrt{5}}{5}$

c. $3\sqrt{20} - 7\sqrt{45} + \sqrt{5}$

$= 3\sqrt{4}\sqrt{5} - 7\sqrt{9}\sqrt{5} + \sqrt{5}$

$= 6\sqrt{5} - 21\sqrt{5} + \sqrt{5} = -14\sqrt{5}$

Same question

3. Simplify

a. $\sqrt{x} \cdot \sqrt[3]{x}$

$x^{\frac{1}{2}} \cdot x^{\frac{1}{3}} = x^{\frac{1}{2}+\frac{1}{3}}$

$= x^{\frac{3+2}{6}}$

$= x^{\frac{5}{6}}$ OR $\sqrt[6]{x^5}$

b. $5\sqrt{3} - \sqrt{3} = 4\sqrt{3}$

4. Simplify.

a) $\frac{5}{\sqrt{15}} \cdot \frac{\sqrt{15}}{\sqrt{15}} = \frac{5\sqrt{15}}{15}$

$= \frac{\sqrt{15}}{3}$

b) $3\sqrt{20} - 7\sqrt{45} + \sqrt{5}$

$= 6\sqrt{5} - 21\sqrt{5} + \sqrt{5}$

$= -14\sqrt{5}$