AA PREP: OPERATIONS WITH RADICALS—WORKSHEET #2 KEY

Perform each operation. Simplify all radicals! Make sure to rationalize the denominator.

1) $-2\sqrt{90}$

$= -2\sqrt{10 \cdot 9}$

$= -2 \cdot 3\sqrt{10}$

$\boxed{-6\sqrt{10}}$

2) $3\sqrt{10} \cdot -4\sqrt{50}$

$3 \cdot -4\sqrt{10 \cdot 50}$

$3 \cdot -4 \cdot 10\sqrt{5}$

$\boxed{-120\sqrt{5}}$

3) $\left(5\sqrt{3}\right)^2$

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

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

$5 \cdot 5 \cdot 3$

$\boxed{75}$

4) $\sqrt{\frac{16}{81}} = \frac{\sqrt{16}}{\sqrt{81}} = \boxed{\frac{4}{9}}$

5) $5\sqrt{12} - 3\sqrt{8} + \sqrt{75}$

$= 5\sqrt{3 \cdot 4} = 3\sqrt{2 \cdot 4} \quad \sqrt{3 \cdot 25}$

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

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

$\boxed{15\sqrt{3} - 6\sqrt{2}}$

6) $\frac{12}{\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}} = \frac{12\sqrt{10}}{10} = \boxed{\frac{6\sqrt{10}}{5}}$

7) $-5\sqrt{12} \cdot 2\sqrt{24}$

$-5 \cdot 2\sqrt{12 \cdot 24}$

$-5 \cdot 2 \cdot 12\sqrt{2}$

$\boxed{-120\sqrt{2}}$

8) $\sqrt{4^2 + 4^2 + 4^2}$

$\sqrt{16 + 16 + 16}$

$\sqrt{48}$

$\sqrt{3 \cdot 16}$

$\sqrt{4 \cdot 4}$

$\boxed{4\sqrt{3}}$

9) $\frac{\sqrt{60}}{\sqrt{45}} = \sqrt{\frac{60 \div 15}{45 \div 15}} = \sqrt{\frac{4}{3}} = \frac{\sqrt{4}}{\sqrt{3}} = \frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

$\boxed{\frac{2\sqrt{3}}{3}}$

10) $2\sqrt{3}\left(5 + 2\sqrt{3} - 7\sqrt{6}\right)$

$10\sqrt{3} + 2\sqrt{3} \cdot 2\sqrt{3} + 2\sqrt{3} \cdot -7\sqrt{6}$

$2 \cdot 2\sqrt{3 \cdot 3} \quad 2 \cdot -7\sqrt{3 \cdot 6}$

$2 \cdot 2 \cdot 3 \quad -2 \cdot 7 \cdot 3\sqrt{2}$

$12 \quad -42\sqrt{2}$

$\boxed{10\sqrt{3} + 12 - 42\sqrt{2}}$