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

Num

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

F: $2\sqrt{5} \cdot 4\sqrt{5} = 8 \cdot 5 = 40$

O: $2\sqrt{5} \cdot \sqrt{10} = 2\sqrt{50}$

$2 \cdot 5\sqrt{25 \cdot 2}$

$= 10\sqrt{2}$

I: $\sqrt{10} \cdot 4\sqrt{5} = 4\sqrt{50}$

$4 \cdot 5\sqrt{25 \cdot 2}$

$= 20\sqrt{2}$

L: $\sqrt{10} \cdot \sqrt{10} = 10$

$= 40 + 10\sqrt{2} + 20\sqrt{2} + 10$

$= 50 + 30\sqrt{2}$

Den

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

F: $4\sqrt{5} \cdot 4\sqrt{5} = 16 \cdot 5 = 80$

L: $-\sqrt{10} \cdot \sqrt{10} = -10$

$80 - 10$

70

$= \frac{50+30\sqrt{2}}{70} = \frac{10(5+3\sqrt{2})}{70}$

7

$= \frac{5+3\sqrt{2}}{7}$