Name: _____

Operations of Radicals

1) Simplify:

1) $6\sqrt{5}+2\sqrt{5}-5\sqrt{5}$

2) $6\sqrt{27}+8\sqrt{12}+2\sqrt{75}$

3) $7\sqrt{2}+8\sqrt{11}-4\sqrt{11}-6\sqrt{2}$

4) $\sqrt{27}+2\sqrt{18}-3\sqrt{3}+2\sqrt{32}$

5) $3\sqrt{45}+2\dfrac{\sqrt{64}}{\sqrt{8}}-4\dfrac{\sqrt{80}}{\sqrt{4}}-5\sqrt{\dfrac{50}{25}}$

6) $\dfrac{1}{4}(\sqrt{54}-\sqrt{6})+\dfrac{1}{8}(\sqrt{96}-\sqrt{24})$

7) $4\sqrt{2}\left(3\sqrt{5}+\sqrt{7}-5+8\sqrt{6}+3\sqrt{2}\right)$

8) $\sqrt{\dfrac{a^4c}{b^3}}+\sqrt{\dfrac{a^2c^3}{bd^2}}-\sqrt{\dfrac{a^2cd^2}{bc^2}}$

9) $\sqrt{75m-25}+\sqrt{108m-36}$

10) $\sqrt[3]{128y^8}+10y\sqrt[3]{54y^5}$

11) $\left(2\sqrt{3}+4\sqrt{2}\right)\left(6\sqrt{3}+2\sqrt{2}\right)$

12) $4\sqrt{28}-5\sqrt{63}+2\sqrt{7}$

13) $\dfrac{3}{7ab}\sqrt{98a^2b^3}$

14) $\sqrt{16a^2b^4+48a^4b^2}$

15) $2\sqrt{\dfrac{4}{7}}\times 3\sqrt{7}$

16) $\sqrt{a^{2n}b^{2n+1}c^{2n+2}}$

2) Write the real number $\sqrt{11-6\sqrt{2}}$ in the form containing one radical sign.

3) Consider the real numbers a = $\sqrt{3+\sqrt{5}}$ and b = $\frac{\sqrt{5}+1}{2}$

1) Calculate a^2 the b^2.
2) Compare a and b

4) Given a = $\sqrt{7-4\sqrt{3}}$ and b = $\sqrt{7+4\sqrt{3}}$.

1) Calculate a × b.
2) Is (a × b) rational or irrational?

5) If $x=\sqrt{6-3\sqrt{2}}$ and $y=\sqrt{6+3\sqrt{2}}$

1) Show that $xy = 3\sqrt{2}$
2) Calculate $(x + y)^2$ and $(x - y)^2$

6) Perform: (a,b, x, & y>0)

1) $\left(x\sqrt{y}-y\sqrt{x}\right)^3$

2) $\left(a\sqrt{\frac{a}{b}}-b\sqrt{\frac{b}{a}}\right)^2$

3) $5x+\sqrt{15x^2+\sqrt{25x^4+75\sqrt[4]{x^{16}}}}$

7) Find the area of a rectangle with a width of $4\sqrt{6}-2\sqrt{10}$ and a length of $5\sqrt{3}+7\sqrt{5}$.

8) Write the real number $\sqrt{11-6\sqrt{2}}$ in the form containing one radical sign.