MATH 2201
RADICALS TEST REVIEW

1. Simplify the following.

(a) $\sqrt{81} - \sqrt[3]{64}$ (b) $\sqrt[3]{27} - \sqrt{25}$ (c) $\sqrt{75}$ (d) $\sqrt[3]{24}$ (e) $\sqrt{98}$ (f) $\sqrt[3]{54}$

2. Express as an entire radical.

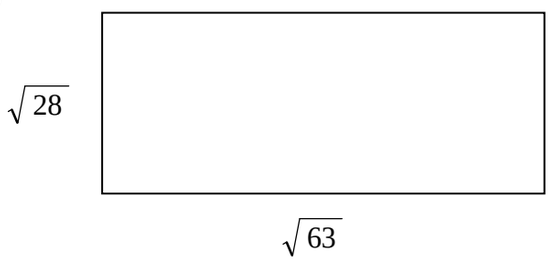
(a) $3\sqrt{7}$ (b) $2\sqrt[3]{3}$ (c) $4\sqrt{2}$ (d) $5\sqrt[3]{4}$

3. Perform the operations indicated and express the answer in simplest radical form.

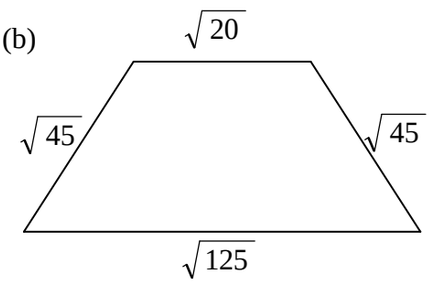
(a) $4\sqrt{7} - 9\sqrt{7} + 3\sqrt{7}$ (b) $\sqrt{12} + \sqrt{48} - \sqrt{27}$ (c) $2\sqrt{20} + \frac{1}{2}\sqrt{32} - 4\sqrt{45} + 5\sqrt{8}$

4. Determine the perimeter of the following diagrams.

(a)



(b)



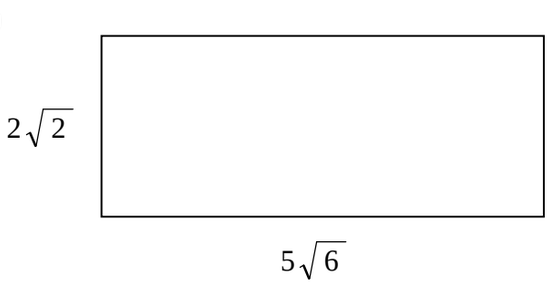
5. Perform the operations indicated and express the answer in simplest radical form.

(a) $3\sqrt{8} \times 4\sqrt{3}$ (b) $\sqrt{2}\left(\sqrt{14} + \sqrt{56}\right)$ (c) $2\sqrt{3}\left(\sqrt{6} + \sqrt{24}\right)$ (d) $\left(\sqrt{5} + \sqrt{3}\right)^2$

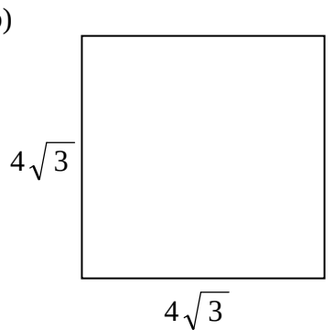
(e) $\left(3\sqrt{3} - 2\sqrt{2}\right)^2$ (f) $\left(\sqrt{5} + \sqrt{2}\right)\left(\sqrt{8} + \sqrt{5}\right)$ (g) $\left(4\sqrt{3} - 3\sqrt{2}\right)\left(3\sqrt{2} + 2\sqrt{27}\right)$

6. Determine the area of the following diagrams.

(a)



(b)



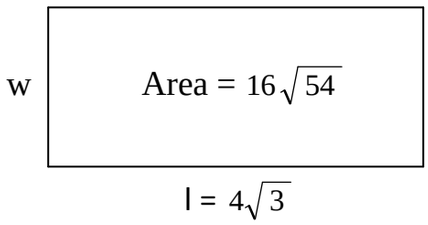
7. Rationalize the denominator.

(a) $\frac{\sqrt{60}}{\sqrt{5}}$ (b) $\frac{-15\sqrt{54}}{3\sqrt{3}}$ (c) $\frac{8}{\sqrt{2}}$ (d) $\frac{2\sqrt{8}}{8\sqrt{5}}$

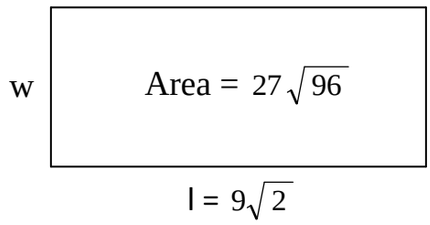
(e) $\frac{8\sqrt{6} - 2\sqrt{24}}{3\sqrt{3}}$ (f) $\frac{2\sqrt{20} - 2\sqrt{45}}{4\sqrt{2}}$

8. Determine the width of the given rectangles.

(a)



(b)



9. Simplify the following algebraic expressions involving radicals.

(a) $4\sqrt{9x^6}$ (b) $2\sqrt{27x^2}$ (c) $-3x\sqrt{50x^4}$ (d) $\left(5\sqrt{6x^3}\right)\left(-2x\sqrt{3x}\right)$

(e) $3\sqrt{x}\left(4\sqrt{x^5}-2\sqrt{x}\right)$ (f) $\left(6\sqrt{x^2}+3\right)\left(5-2\sqrt{x^2}\right)$ (g) $\dfrac{\sqrt{12x^5}}{\sqrt{3x}}$

(h) $\dfrac{3x\sqrt{15x^3}}{2\sqrt{5x}}$ (i) $\dfrac{4x\sqrt{12x}-2\sqrt{27x^3}}{\sqrt{3x}}$

10. Solve the following radical equations.

(a) $\sqrt{x}=4$ (b) $\sqrt[3]{x}=-3$ (c) $\sqrt{3x}=9$ (d) $2\sqrt[3]{2x}=8$ (e) $3\sqrt{2x}=18$

(f) $\sqrt{x-3}=5$ (g) $\sqrt[3]{x+4}=-2$ (h) $2\sqrt{5x+9}=14$ (i) $3\sqrt[3]{2x-4}=6$

(j) $\sqrt{2x-8}+4=10$ (k) $\sqrt{3x+15}+11=17$

SOLUTIONS

1. (a) 5 (b) -2 (c) $5\sqrt{3}$ (d) $2\sqrt[3]{3}$ (e) $7\sqrt{2}$ (f) $3\sqrt[3]{2}$
2. (a) $\sqrt{63}$ (b) $\sqrt[3]{24}$ (c) $\sqrt{32}$ (d) $\sqrt[3]{500}$
3. (a) $-2\sqrt{7}$ (b) $3\sqrt{3}$ (c) $-8\sqrt{5}+12\sqrt{2}$
4. (a) $10\sqrt{7}$ (b) $13\sqrt{5}$
5. (a) $24\sqrt{6}$ (b) $6\sqrt{7}$ (c) $18\sqrt{2}$ (d) $8+2\sqrt{15}$ (e) $35-12\sqrt{6}$
   (f) $9+3\sqrt{10}$ (g) $54-6\sqrt{6}$
6. (a) $20\sqrt{3}$ (b) 48
7. (a) $2\sqrt{3}$ (b) $-15\sqrt{2}$ (c) $4\sqrt{2}$ (d) $\dfrac{\sqrt{10}}{10}$ (e) $\dfrac{4\sqrt{2}}{3}$ (f) $\dfrac{-\sqrt{10}}{4}$
8. (a) $12\sqrt{2}$ (b) $12\sqrt{3}$
9. (a) $12x^3$ (b) $6x\sqrt{3}$ (c) $-15x^3\sqrt{2}$ (d) $-30x^3\sqrt{2}$ (e) $12x^3-6x$
   (f) $-12x^2+24x+15$ (g) $2x^2$ (h) $\dfrac{3x^2\sqrt{3}}{2}$ (i) $6x^2$
10. (a) $x=16$ (b) $x=\sqrt[3]{-27}$ (c) $x=27$ (d) $x=32$ (e) $x=18$ (f) $x=28$ (g) $x=-12$
    (h) $x=8$ (i) $x=6$ (j) $x=22$ (k) $x=7$