Math 2201 **Chapter 4 Radicals Review** **Name____________**

1. Simplify:

(A) $\sqrt{45}$ (B) $3\sqrt{80x^3}$ (C) $\sqrt[3]{54x^6y}$

2. Write as an entire radical:

(A) $3\sqrt{2}$ (B) $2x\sqrt[3]{4}$ (C) $3xy\sqrt{2x}$

3. State the restrictions for each of the following:

(A) $\sqrt{x^2}$ (B) $\sqrt{2x}$ (C) $\sqrt{3x+2}$

(D) $\dfrac{\sqrt{3x}}{x^2}$ (E) $\dfrac{4x\sqrt{x}}{\sqrt{x^3}}$

4. Simplify:

(A) $3\sqrt{6x}-5\sqrt{10}+8\sqrt{6x}-2\sqrt{10}$ (B) $\sqrt{50}-4\sqrt{2}+\sqrt{18}$

(C) $\sqrt{27x^3}+2\sqrt{12x^3}-2x\sqrt{3x}$ (D) $\left(3\sqrt{2}\right)\left(5\sqrt{6}\right)$

(E) $\sqrt{6x^3}\cdot\sqrt{3x^2}$ (F) $-3x\sqrt{5x^2}\left(2\sqrt{10x}\right)$

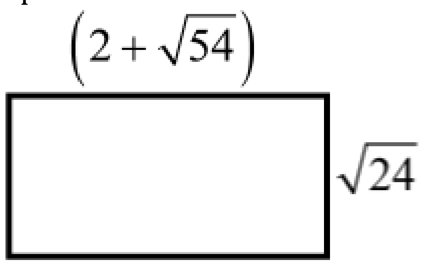
(G) $\left(3\sqrt{6}\right)\left(\sqrt{2}\right)+2\sqrt{75}$ (H) $3x\sqrt{2}\left(x\sqrt{10}+\sqrt{2}\right)$

(I) $\left(3-\sqrt{2}\right)\left(2-5\sqrt{2}\right)$ (J) $\left(6+\sqrt{5x}\right)^2$

(K) $\dfrac{2}{\sqrt{3}}$ (L) $\dfrac{40\sqrt{x^5}}{8\sqrt{x^2}}$

(M) $\dfrac{3-2\sqrt{x}}{\sqrt{x}}$

5. Find the perimeter and area for the rectangle below in simplest form.



6. Solve each equation and verify the solution.

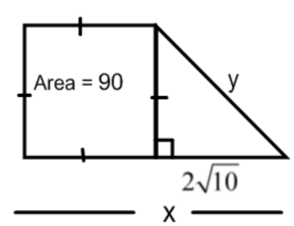
(A) $\sqrt[3]{2x}-6=-2$ (B) $\sqrt{2x-1}+3=6$ (C) $4\sqrt{3x+1}=-8$

7. The speed that a tsunami (tidal wave) can travel is modeled by the equation $S=356\sqrt{d}$ where S is the speed of the tsunami in km/h and d is the average depth of the water in km. A tsunami is found to be travelling at 120 km/h, what is the average depth of the water? Round your answer to three decimal places.

8. Suppose the function, $S=\pi\sqrt{\frac{9.8l}{7}}$, where S represents speed in meters per second and l is the leg length of a person in meters, can approximate the maximum speed that a person can run. What is the leg length of a person with a running speed of 2.7 meters per second to the nearest tenth of a meter?

9. A cylindrical container of chocolate drink mix has a volume of 162 cubic inches. The radius r of the container can be found by using the formula , $r=\sqrt{\frac{V}{\pi h}}$, where V is the volume of the container and h is the height. If the radius is 2.5 inches, find the height of the container. Round your answer to the nearest hundredth.

10. Use the diagram to determine the length x and y in simplest terms.



Answers:

1. (A) $3\sqrt{5}$ (B) $12x\sqrt{5x}$ (C) $3x^2\sqrt[3]{2y}$

2. (A) $\sqrt{18}$ (B) $\sqrt[3]{32x^3}$ (C) $\sqrt{18x^3y^2}$

3. (A) $x \in R$ (B) $x \geq 0, x \in R$ (C) $x \geq -\frac{2}{3}, x \in R$

   (D) $x > 0, x \in R$ E) $x > 0, x \in R$

4. (A) $11\sqrt{6x} - 7\sqrt{10}$ (B) $4\sqrt{2}$ (C) $5x\sqrt{3x}$

   (D) $30\sqrt{3}$ E) $3x^2\sqrt{2x}$ F) $-30x^2\sqrt{2x}$

   G) $16\sqrt{3}$ H) $6x^2\sqrt{5} + 6x$ I) $16 - 17\sqrt{2}$

   J) $36 + 12\sqrt{5x} + 5x$ K) $\frac{2\sqrt{3}}{3}$ L) $5x\sqrt{x}$

   M) $\frac{3\sqrt{x} - 3x}{x}$

5. Perimeter = $4 + 10\sqrt{6}$ Area = $4\sqrt{6} + 36$

6. (A) x = 32 (don't forget the check!!)

   (B) x = 5

   (C) x = 5 (reject…it's an extraneous root)

7. d = 0.114 km 8. l = 0.5 m 9. H = 6.42 inches

10. $y = \sqrt{130}$ $x = 3\sqrt{10} + 2\sqrt{10} = 5\sqrt{10}$