ASSIGNMENT 11

DYLAN ZWICK'S MATH 1010 CLASS

1. SECTION 7.2

Simplify the radical.

7.2.1: $\sqrt{18}$

7.2.2: $\sqrt{27}$

7.2.3: $\sqrt{45}$

7.2.5: $\sqrt{96}$

7.2.7: $\sqrt{153}$

7.2.10: $\sqrt{1176}$

Simplify the radical expression.

7.2.19: $\sqrt{9x^5}$

7.2.22: $\sqrt{32x}$

7.2.26: $\sqrt{125u^4v^6}$

7.2.29: $\sqrt[3]{48}$

7.2.33: $\sqrt[3]{40x^5}$

7.2.35: $\sqrt[4]{324y^6}$

7.2.40: $\sqrt[4]{128u^4v^7}$

7.2.42: $\sqrt[3]{16x^4y^5}$

7.2.49: $\sqrt[5]{\dfrac{32x^2}{y^5}}$

Rationalize the denominator and simplify further, if possible.

7.2.55: $\sqrt{\dfrac{1}{3}}$

7.2.69: $\dfrac{6}{\sqrt{3b^3}}$

7.2.76: The time t (in seconds) for a pendulum of length L (in feet) to go through one complet cycle (its period) is given by

$$t = 2\pi\sqrt{\frac{L}{32}}.$$

Find the period of a pendulum whose length is 4 feet. (Round your answer to two decimal places.)

2. SECTION 7.3

Combine the radical expressions, if possible.

7.3.1: $3\sqrt{2} - \sqrt{2}$

7.3.2: $6\sqrt{5} - 2\sqrt{5}$

7.3.4: $3\sqrt{7} + 2\sqrt{7}$

7.3.7: $9\sqrt[3]{5} - 6\sqrt[3]{5}$

7.3.10: $13\sqrt{x} + \sqrt{x}$

7.3.12: $9\sqrt[4]{t} - 3\sqrt[4]{t}$

7.3.13: $8\sqrt{2} + 6\sqrt{2} - 5\sqrt{2}$

7.3.15: $\sqrt[4]{5} - 6\sqrt[4]{13} + 3\sqrt[4]{5} - \sqrt[4]{13}$

7.3.18: $5\sqrt{7} - 8\sqrt[4]{11} + \sqrt{7} + 9\sqrt[4]{11}$

7.3.21: $3\sqrt{45} + 7\sqrt{20}$

7.3.24: $4\sqrt[4]{48} - \sqrt[4]{243}$

7.3.25: $5\sqrt{9x} - 3\sqrt{x}$

7.3.26: $4\sqrt{y} + 2\sqrt{16y}$

7.3.29: $\sqrt{25y} + \sqrt{64y}$

7.3.30: $\sqrt[3]{16t^4} - \sqrt[3]{54t^4}$

7.3.35: $\sqrt[3]{6x^4} + \sqrt[3]{48x}$

7.3.38: $\sqrt{4y + 12} + \sqrt{y + 3}$

7.3.39: $\sqrt{x^3 - x^2} + \sqrt{4x - 4}$

7.3.46: $5\sqrt[3]{320x^5y^8} + 2x\sqrt[3]{135x^2y^8}$

Perform the addition or subtraction and simplify your answer.

7.3.47: $\sqrt{5} - \dfrac{3}{\sqrt{5}}$

7.3.50: $\sqrt{\dfrac{1}{5}} - \sqrt{45}$

7.3.53: $\dfrac{2}{\sqrt{3x}} + \sqrt{3x}$

3. SECTION 7.4

Multiply and simplify.

7.4.1: $\sqrt{2} \cdot \sqrt{8}$

7.4.4: $\sqrt{5} \cdot \sqrt{10}$

7.4.9: $\sqrt{7}(3 - \sqrt{7})$

7.4.10: $\sqrt{3}(4 + \sqrt{3})$

7.4.14: $\sqrt{10}(\sqrt{5} + \sqrt{6})$

7.4.17: $\sqrt{y}(\sqrt{y} + 4)$

7.4.23: $(\sqrt{5} + 3)(\sqrt{3} - 5)$

7.4.25: $(\sqrt{20} + 2)^2$

7.4.28: $(\sqrt[3]{9} + 5)(\sqrt[3]{12} - 5)$

7.4.35: $(10 + \sqrt{2x})^2$

7.4.40: $(\sqrt{7} - 3\sqrt{3t})(\sqrt{7} + 3\sqrt{3t})$

7.4.43: $(\sqrt[3]{y} + 2)(\sqrt[3]{y^2} - 5)$

7.4.49: $2\sqrt[3]{x^4y^5}(\sqrt[3]{8x^{12}y^4} + \sqrt[3]{16xy^9})$

Find the conjugate of the expression. Then multiply the expression by its conjugate and simplify.

7.4.57: $2 + \sqrt{5}$

7.4.61: $\sqrt{15} + 3$

7.4.63: $\sqrt{x} - 3$

7.4.70: $33\sqrt{u} + \sqrt{3v}$

Evaluate the function as indicated and simplify.

7.4.71: $f(x) = x^2 - 6x + 1$
(a)$f(2 - \sqrt{3})$ (b) $f(3 - 2\sqrt{2})$

7.4.74: $g(x) = x^2 - 4x + 1$
(a)$g(1 + \sqrt{5})$ (b) $g(2 - \sqrt{3})$

Simplify the expression.

7.4.75: $\dfrac{6}{\sqrt{11} - 2}$

7.4.81: $\dfrac{2}{\sqrt{6} + \sqrt{2}}$

7.4.85: $(\sqrt{7} + 2) \div (\sqrt{7} - 2)$

7.4.97: $\dfrac{\sqrt{u + v}}{\sqrt{u - v} - \sqrt{u}}$

7.4.98: $\dfrac{z}{\sqrt{u + z} - \sqrt{u}}$

7.4.114(a): The ratio of the width of the Temple of Hephaestus to its height is approximately

$$\frac{w}{h} \approx \frac{2}{\sqrt{5} - 1}.$$

This number is called the *golden section*. Early Greeks believed that the most aesthetically pleasing rectangles were those whose sides had this ratio.

Rationalize the denominator for this expression. Approximate your answer, rounded to two decimal places.

4. SECTION 7.5

Determine whether each value of x is a solution of the equation.

	Equation	Values of x
7.5.1:	$\sqrt{x} - 10 = 0$	(a) -4 (b) -100 (c) $\sqrt{10}$ (d) 100

	Equation	Values of x
7.5.3:	$\sqrt[3]{x - 4} = 4$	(a) -60 (b) 68 (c) 20 (d) 0

Solve the equation and check your solution(s).

7.5.5: $\sqrt{x} = 12$

7.5.8: $\sqrt{t} = 4$

7.5.11: $\sqrt{y} - 7 = 0$

7.5.14: $\sqrt{y} + 15 = 0$

7.5.16: $\sqrt{x} - 10 = 0$

7.5.19: $\sqrt{-3x} = 9$

7.5.21: $\sqrt{5t} - 2 = 0$

7.5.24: $\sqrt{3 - 2x} = 2$

7.5.27: $\sqrt[3]{y - 3 + 4} = 6$

7.5.29: $6\sqrt[4]{x + 3} = 15$

7.5.31: $\sqrt{x + 3} = \sqrt{2x - 1}$

7.5.33: $\sqrt{3y - 5} - 3\sqrt{y} = 0$

7.5.36: $2\sqrt[3]{10 - 3x} = \sqrt[3]{2 - x}$

7.5.39: $\sqrt{x^2 - 2} = x + 4$

7.5.44: $\sqrt{3x + 7} = x + 3$

7.5.46: $\sqrt{2x - 7} = \sqrt{3x - 12}$

7.5.47: $\sqrt{z + 2} = 1 + \sqrt{z}$

7.5.48: $\sqrt{2x + 5} = 7 - \sqrt{2x}$

7.5.54: $\sqrt{x+3} - \sqrt{x-1} = 1$

7.5.55: $t^{\frac{3}{2}} = 8$

7.5.58: $2x^{\frac{3}{4}} = 54$

7.5.60: $(u-2)^{\frac{4}{3}} = 81$

7.5.85: The screen of a plasma television has a diagonal of 50 inches and a width of 43.75 inches. Draw a diagram of the plasma television and tind the length of the screen.