Name_____Period_____Date_____

UNIT 10: RADICALS PACKET

Lesson 1: Simplifying Radicals

Simplify each radical without a calculator. No decimal answers.

1) $\sqrt{121}$	2) $\sqrt{-64}$
3) $\sqrt{-1}$	4) $\sqrt{225}$
5) $\sqrt{50}$	6) $\pm\sqrt{18}$
7) $\pm\sqrt{13}$	8) $\sqrt{75}$
9) $-\sqrt{72}$	10) $\sqrt{6}$

Simplify each radical without a calculator. No decimal answers.

11) $\sqrt{243}$	12) $4\sqrt{4}$
13) $\pm\sqrt{486}$	14) $-\dfrac{1}{3}\sqrt{120}$
15) $3\sqrt{8}$	16) $\sqrt{\dfrac{18}{25}}$
17) $\dfrac{\sqrt{72}}{6}$	18) $\sqrt{\dfrac{40}{90}}$
19) $\sqrt{9}\cdot 4\sqrt{25}$	20) $\sqrt{7}\cdot\dfrac{\sqrt{18}}{\sqrt{2}}$

Simplify each radical expression without a calculator. No decimal answers.

21) $5\sqrt{7} + 2\sqrt{7}$	22) $4\sqrt{6} - 4\sqrt{6}$
23) $-6\sqrt{3} - 7\sqrt{3}$	24) $-5\sqrt{7} + 7\sqrt{5}$
25) $\sqrt{8} + 2\sqrt{2}$	26) $4\sqrt{5} - 2\sqrt{45}$
27) $\dfrac{\sqrt{6}}{3} - \dfrac{2}{3}$	28) $-4\sqrt{10} + 6\sqrt{40}$
29) $3\sqrt{11} + \sqrt{176} - \sqrt{11}$	30) $\sqrt{243} - \sqrt{75} + \sqrt{300}$

Lesson 2: Multiplying Radicals

Simplify each radical expression without a calculator. No decimal answers.

31) $\sqrt{3}\cdot\sqrt{27}$

32) $\sqrt{18}\cdot\sqrt{8}$

33) $\sqrt{15}\cdot\sqrt{35}$

34) $\sqrt{27}\cdot\sqrt{12}$

35) $6\sqrt{3}\cdot\sqrt{8}$

36) $4\sqrt{2}\cdot3\sqrt{4}$

37) $\left(2\sqrt{3}\right)^2$

38) $\left(7\sqrt{11}\right)^2$

39) $\left(2\sqrt{3}-5\right)^2$

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

Lesson 2: Dividing Radicals

Simplify each radical expression without a calculator. No decimal answers.

41) $\sqrt{\dfrac{16}{4}}$	42) $\sqrt{\dfrac{13}{100}}$
43) $\sqrt{\dfrac{12}{27}}$	44) $\sqrt{\dfrac{48}{75}}$
45) $\sqrt{\dfrac{90}{5}}$	46) $\sqrt{\dfrac{81}{3}}$
47) $\dfrac{2}{\sqrt{2}}$	48) $\dfrac{6}{\sqrt{3}}$
49) $\dfrac{4}{5}\sqrt{\dfrac{3}{20}}$	50) $\dfrac{4\sqrt{5}}{\sqrt{8}}$

Lesson 2 (Review): Radicals – Mixed Operations

Simplify each radical expression without a calculator. No decimal answers.

51) $\sqrt{5} \cdot -4\sqrt{20}$	52) $-3\sqrt{6} + 3\sqrt{6}$
53) $3\sqrt{8} + 3\sqrt{2}$	54) $\dfrac{5}{\sqrt{5}}$
55) $-4\sqrt{5} - 5\sqrt{4}$	56) $\sqrt{\dfrac{77}{7}}$
57) $\sqrt{\dfrac{4}{3}}$	58) $-3\sqrt{2} + 3\sqrt{10} - 5\sqrt{8}$
59) $\sqrt{\dfrac{13}{52}}$	60) $\dfrac{2\sqrt{6}}{\sqrt{6}}$

Lesson 4: *Solving Radical Equations (Ready… Already Isolated!)*

Solve each radical equation. Check for extraneous solutions. No decimal answers.

61) $\sqrt{x} = 2$	62) $8 = \sqrt{t}$
63) $\sqrt{n+7} = 12$	64) $3 = \sqrt{a-6}$
65) $\sqrt{2r+5} = -3$	66) $\sqrt{9b} = -9$
67) $\sqrt{3x+1} = \sqrt{5x-8}$	68) $\sqrt{7v-4} = \sqrt{5v+10}$
69) $\sqrt{n+5} = \sqrt{5n-11}$	70) $\sqrt{2y} = \sqrt{9-y}$

Solve each radical equation. Check for extraneous solutions. No decimal answers.

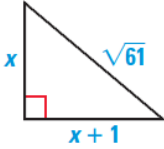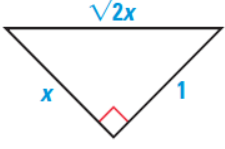|	
71) $\sqrt{x} - 10 = 0$	72) $\sqrt{y} + 8 = 2$
73) $-6 + \sqrt{2d} = 0$	74) $\sqrt{5a} + 7 = 17$
75) $\sqrt{5x+1} + 2 = 6$	76) $10 = 4 + \sqrt{5n+11}$
77) $-8\sqrt{2b-3} = -8$	78) $5 = -6 - \sqrt{10x-2}$
79) $4 = 7 - \sqrt{33y-2}$	80) $6 - \sqrt{7x-9} = 3$

Lesson 5: *Pythagorean Theorem*

Use the Pythagorean Theorem to solve each problem. No decimal answers.

81) Do the following measurements create a right triangle? 20 ft, 21 ft, 29 ft	82) Do the following measurements create a right triangle? 16 in, 30 in, 34 in
83) Do the following measurements create a right triangle? 4.4 yd, 5.5 yd, 3.5 yd	84) Do the following measurements create a right triangle? 7.5 cm, 6.7 cm, 4.3 cm
85) Find the missing side of the right triangle. $a = 12, \ b = 35, \ c = ?$	86) Find the missing side of the right triangle. $a = 19, \ b = ?, \ c = 26$
87) Find the missing side of the right triangle. $a = ?, \ b = 8, \ c = 12$	88) Find the missing side of the right triangle. $a = 14, \ b = 14, \ c = ?$
89) Find the missing side of the right triangle. $a = ?, \ b = 6, \ c = 9$	90) Find the missing side of the right triangle. $a = ?, \ b = 15, \ c = 20$

Lesson 5: *Pythagorean Theorem Applications*

Use the Pythagorean Theorem to solve each problem.

91) Find each missing lengt h. x $\sqrt{61}$ $x+1$	92) Find each missing length. $\sqrt{2x}$ x 1
93) A ladder 8 m long is resting against a building. The bottom of the ladder is 3 m from the wall. To the *nearest tenth*, how far up the wall does the ladder reach?	94) A plane flies 150 miles due south, then 75 miles due west. To the *nearest mile*, how far is the plane from its starting point?
95) A ramp was constructed to load a truck. If the ramp is 9 feet long and the horizontal distance from the bottom of the ramp to the truck is 7 feet, what is the vertical height of the ramp?	96) A wire is run between the tips of two poles. One pole is 23 ft higher than the other pole. The poles are 37 ft apart. How long does the wire need to be to reach between the two poles?
97) Carson found an old tent in the attic of his house and decided to set it up in the back yard. However, the support sticks for the tent are missing. If the tent is 90 inches across on the bottom and 53 inches on each side, how tall of a stick does he need to set up the tent?	98) Oscar's dog house is shaped like a tent. The slanted sides are both 5 feet long and the bottom of the house is 6 feet across. What is the height of his dog house, in feet, at its tallest point?
99) A triangular flag is attached to a post. The length of the bottom of the flag measures 12 in and is 48 in above the ground. The diagonal of the flag measures 15 in. How far above the ground is the top of the flag?	100) A 10 ft high fire truck parks beside a building such that the base of the ladder is 16 ft from the building. The fire truck extends its ladder 30 ft. How high is the top of the ladder above the ground?