Geomet	ry Regents Lomac 2	015-2016 Date 2/5	due <u>2/8</u>	Similarity: Simplifying Radicals	7.1R		
Name	<u>.</u>		Per				
LO:	I can simplify radical expressions including adding, subtracting, multiplying, dividing and rationalizing denominators.						
	IOW On the back	of this packet					
(1) calculator	Simplifying Radicals: Finding hidden perfect squares and taking their root. Simplify each expression by factoring to find perfect squares and then taking their root.						
	1) $\sqrt{75}$		2) $\sqrt{16}$				
	3) $\sqrt{36}$		4) $\sqrt{64}$				
	5) $\sqrt{80}$		6) $\sqrt{30}$				
	7) $\sqrt{8}$		8) $\sqrt{18}$				
	9) $\sqrt{32}$		10) $\sqrt{12}$				
	11) $\sqrt{8}$		12) $\sqrt{108}$				
	13) $\sqrt{125}$		14) $\sqrt{50}$				
	15) $\sqrt{175}$		16) \[16]				
	17) $\sqrt{45}$		18) $\sqrt{72}$				
	19) $\sqrt{20}$		20) $\sqrt{150}$				

(2) calculator

Simplifying Radical Expressions: Adding and Subtracting

Add or subtract radicals by simplifying	a. $2\sqrt{2} + \sqrt{5} - 6\sqrt{2} = -4\sqrt{2} + \sqrt{5}$	Subtract like radicals.
each term and then compining like terms.	b. $4\sqrt{3} - \sqrt{27} = 4\sqrt{3} - \sqrt{9 \cdot 3}$	Perfect square factor
	$=4\sqrt{3}-\sqrt{9}\cdot\sqrt{3}$	Use product property.
	$=4\sqrt{3}-3\sqrt{3}$	Simplify.
	$=\sqrt{3}$	Subtract like radicals.
1) $3\sqrt{6} - 4\sqrt{6}$	2) $-3\sqrt{7} + 4\sqrt{7}$	

3)
$$-11\sqrt{21} - 11\sqrt{21}$$
 4) $-9\sqrt{15} + 10\sqrt{15}$

5)
$$-10\sqrt{7} + 12\sqrt{7}$$
 6) $-3\sqrt{17} - 4\sqrt{17}$

7)
$$-10\sqrt{11} - 11\sqrt{11}$$
 8) $-2\sqrt{3} + 3\sqrt{27}$

9)
$$2\sqrt{6} - 2\sqrt{24}$$
 10) $2\sqrt{6} + 3\sqrt{54}$

11)
$$-\sqrt{12} + 3\sqrt{3}$$
 12) $3\sqrt{3} - \sqrt{27}$

13)
$$3\sqrt{8} + 3\sqrt{2}$$
 14) $-3\sqrt{6} + 3\sqrt{6}$

(3) Simplifying Radical Expressions: Multiplying

(a) Multiply numbers that are BOTH OUTSIDE the radical. Multiply numbers that are BOTH INSIDE the radical. Simplify the expression

$$2 \cdot 5 =$$
 $2 \cdot \sqrt{5} =$
 $\sqrt{2} \cdot 5 =$
 $2\sqrt{3} \cdot 5 =$
 $2\sqrt{3} \cdot \sqrt{5} =$
 $2\sqrt{3} \cdot 4\sqrt{5} =$

 1) $\sqrt{6} \cdot 4\sqrt{6}$
 2) $-\sqrt{5} \cdot \sqrt{20}$

$$3) -\sqrt{2} \cdot \sqrt{3} \qquad \qquad 4) 4\sqrt{8} \cdot \sqrt{2}$$

5)
$$\sqrt{12} \cdot \sqrt{15}$$
 6) $\sqrt{5} \cdot -2\sqrt{5}$

7)
$$-3\sqrt{5} \cdot \sqrt{20}$$
 8) $\sqrt{15} \cdot 3\sqrt{5}$

9)
$$\sqrt{9} \cdot \sqrt{3}$$
 10) $-4\sqrt{8} \cdot \sqrt{10}$



13)
$$\frac{\sqrt{2}}{\sqrt{6}}$$
 14) $\frac{\sqrt{21}}{\sqrt{15}}$

$$15) \ \frac{\sqrt{3}}{6\sqrt{7}} \qquad \qquad 16) \ \frac{\sqrt{5}}{\sqrt{3}}$$

17)
$$\frac{\sqrt{15}}{3\sqrt{6}}$$

$$18) \frac{\sqrt{8}}{2\sqrt{7}}$$

(5) calculator

Exit Ticket ON THE LAST PAGE

(6) calculator	Homework					
	Simplify each radical expression. ODD PROBLEMS REQUIRED					
	1.	$\sqrt{5} \sqrt{15}$	2. √	<u>14</u> √35		
	3	$\sqrt{2}(\sqrt{3} - \sqrt{5})$	4	$\sqrt{3}(\sqrt{27} - \sqrt{3})$		
	5.			vo(v2/ vo)		
	-		C			
	5.	$\sqrt{2}(\sqrt{6} + \sqrt{10})$	6.	$\sqrt{7}(3 - \sqrt{7})$		
	7	$\sqrt{5}(3\sqrt{5} - 4\sqrt{3})$	8	$\sqrt{y}(\sqrt{y} - \sqrt{5})$		
			0.			

(6) calculator Homework Simplify each radical expression. ODD PROBLEMS REQUIRED 23. $\sqrt{\frac{24}{25}}$ 22. $\sqrt{\frac{14}{y^2}}$ 21. $\sqrt{\frac{27}{16}}$ 24. $\sqrt{\frac{7}{5}}$ 25. $\sqrt{\frac{10}{7}}$ 26. $\frac{2}{\sqrt{3}}$ 27. $\frac{5}{\sqrt{10}}$ 28. $\frac{6}{\sqrt{3}}$ 29. $\frac{2}{\sqrt{6}}$ • 15) $-3\sqrt{20} - \sqrt{5}$ 16) $2\sqrt{45} - 2\sqrt{5}$ 17) $3\sqrt{18} - 2\sqrt{2}$ 18) $-3\sqrt{18} + 3\sqrt{8} - \sqrt{24}$

19) $3\sqrt{18} + 3\sqrt{12} + 2\sqrt{27}$ 20) $-3\sqrt{5} - \sqrt{6} - \sqrt{5}$

Exit Ticket	Name		Date	Per	7.1R
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(1) The LO (Learning Outcomes) are written below your name on the front of this packet. Demonstrate your achievement of these outcomes by doing the following:

Simplify each expression completely.

2. $\sqrt{14} \sqrt{35}$

16) $2\sqrt{45} - 2\sqrt{5}$

18)
$$-3\sqrt{18} + 3\sqrt{8} - \sqrt{24}$$

4. $\sqrt{3}(\sqrt{27} - \sqrt{3})$

How is the number trying to "come between us?" mathematically silly?



8			
DO NOW	Name	_ Date	_Per

A perfect square is a number whose square root is an integer. Use the pattern below to fill in the remaining perfect squares and their roots. (USE A CALCULATOR)

7.1R

1 ² = 1	so $\sqrt{1} = 1$	16 ² = 256	SO	$\sqrt{256} = 16$
2 ² = 4	so $\sqrt{4} = 2$	17² =	SO	√=
3 ² = 9	so $\sqrt{9} = $	18 ² =	SO	√=
4 ² =	so $\sqrt{16} =$	19 ² = 361	SO	$\sqrt{361} = $
5 ² = 25	so $\sqrt{25} =$	202 =	SO	√=
6 ² =	so $=$	21 ² =	SO	$\sqrt{441} = $
72 =	so $\sqrt{49} = $	22 ² =	SO	√=
8 ² =	so $=$	23 ² =	SO	√=
92 =	so $\sqrt{81} =$	24 ² = 576	SO	$\sqrt{576} = $
10 ² =	so $=$	25 ² = 625	SO	$\sqrt{625} = 25$
112 =	so $=$	26 ² =	SO	√=
12² =	so $=$	27 ² = 729	SO	$\sqrt{729} = 27$
13² =	so $=$	28 ² = 784	SO	$\sqrt{784} = 28$
14 ² =	so $\sqrt{196} =$	29² =	SO	√=
15² =	so $\sqrt{225} = $	30 ² = 900	SO	$\sqrt{900} = 30$

1)
$$3\sqrt{6} - 4\sqrt{6}$$

 $-\sqrt{6}$

3)
$$-11\sqrt{21} - 11\sqrt{21}$$

 $-22\sqrt{21}$

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

 $\sqrt{7}$

4)
$$-9\sqrt{15} + 10\sqrt{15}$$

 $\sqrt{15}$

5)
$$-10\sqrt{7} + 12\sqrt{7}$$

 $2\sqrt{7}$
6) $-3\sqrt{17} - 4\sqrt{17}$
 $-7\sqrt{17}$

7)
$$-10\sqrt{11} - 11\sqrt{11}$$

 $-21\sqrt{11}$
8) $-2\sqrt{3} + 3\sqrt{27}$
 $7\sqrt{3}$

9)
$$2\sqrt{6} - 2\sqrt{24}$$

 $-2\sqrt{6}$
10) $2\sqrt{6} + 3\sqrt{54}$
 $11\sqrt{6}$

11)
$$-\sqrt{12} + 3\sqrt{3}$$

 $\sqrt{3}$
12) $3\sqrt{3} - \sqrt{27}$
0

13) $3\sqrt{8} + 3\sqrt{2}$ $9\sqrt{2}$

14)
$$-3\sqrt{6} + 3\sqrt{6}$$

15)
$$-3\sqrt{20} - \sqrt{5}$$

 $-7\sqrt{5}$
16) $2\sqrt{45} - 2\sqrt{5}$
 $4\sqrt{5}$

17)
$$3\sqrt{18} - 2\sqrt{2}$$

 $7\sqrt{2}$

19) $3\sqrt{18} + 3\sqrt{12} + 2\sqrt{27}$

 $9\sqrt{2} + 12\sqrt{3}$

$$18) -3\sqrt{18} + 3\sqrt{8} - \sqrt{24} \\ -3\sqrt{2} - 2\sqrt{6}$$

$$20) -3\sqrt{5} - \sqrt{6} - \sqrt{5}$$
$$-4\sqrt{5} - \sqrt{6}$$

21)
$$-3\sqrt{2} + 3\sqrt{20} - 3\sqrt{8}$$

 $-9\sqrt{2} + 6\sqrt{5}$
22) $-3\sqrt{3} - \sqrt{8} - 3\sqrt{3}$
 $-6\sqrt{3} - 2\sqrt{2}$

23)
$$-2\sqrt{20} + 2\sqrt{18} - 2\sqrt{5}$$

 $-6\sqrt{5} + 6\sqrt{2}$
24) $2\sqrt{18} - 2\sqrt{11}$
 $12\sqrt{2} - 4\sqrt{11}$

25)
$$-\sqrt{45} + 2\sqrt{5} - \sqrt{20} - 2\sqrt{6}$$

 $-3\sqrt{5} - 2\sqrt{6}$

27)
$$-3\sqrt{45} + 2\sqrt{12} + 3\sqrt{6} - 3\sqrt{20}$$

 $-15\sqrt{5} + 4\sqrt{3} + 3\sqrt{6}$

24)
$$2\sqrt{18} - 2\sqrt{12} + 2\sqrt{18}$$

 $12\sqrt{2} - 4\sqrt{3}$

26)
$$2\sqrt{20} - \sqrt{20} + 3\sqrt{20} - 2\sqrt{45}$$

 $2\sqrt{5}$

$$28) -\sqrt{27} - 3\sqrt{45} - \sqrt{20} + 2\sqrt{45} - 3\sqrt{3} - 5\sqrt{5}$$

1) $\sqrt{75}$ $5\sqrt{3}$	2) $\sqrt{16}$
3) $\sqrt{36}$	4) √64 8
5) $\sqrt{80}$	6) $\sqrt{30}$
$4\sqrt{5}$	$\sqrt{30}$
7) $\sqrt{8}$ $2\sqrt{2}$	$8) \sqrt{18} \\ 3\sqrt{2}$
9) $\sqrt{32}$	10) $\sqrt{12}$
$4\sqrt{2}$	$2\sqrt{3}$
11) $\sqrt{8}$	12) $\sqrt{108}$
$2\sqrt{2}$	$6\sqrt{3}$
13) $\sqrt{125}$	14) $\sqrt{50}$
$5\sqrt{5}$	$5\sqrt{2}$
15) $\sqrt{175}$	16) $\sqrt{28}$
$5\sqrt{7}$	$2\sqrt{7}$
17) $\sqrt{45}$	18) $\sqrt{72}$
$3\sqrt{5}$	$6\sqrt{2}$
$19) \sqrt{20}$	$20) \sqrt{150}$

a.
$$\frac{3}{\sqrt{5}} = \frac{3}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}}$$
 Multiply numerator and denominator by $\sqrt{5}$.
 $= \frac{3\sqrt{5}}{\sqrt{5} \cdot \sqrt{5}}$ Multiply fractions.
 $= \frac{3\sqrt{5}}{5}$ Simplify.
b. $\frac{1}{c - \sqrt{d}} = \frac{1}{c - \sqrt{d}} \cdot \frac{c + \sqrt{d}}{c + \sqrt{d}}$ Multiply numerator and denominator by the conjugate.
 $= \frac{c + \sqrt{d}}{(c - \sqrt{d})(c + \sqrt{d})}$ Multiply fractions.

 $=\frac{c+\sqrt{d}}{c^2}$

Multiply fractions.

Simplify.

