Name: _____ Date: _____ Period: _____

Review Unit 5: Radical Operations, Exponential Equations, and Sequences

Evaluate the following radicals

1. $\sqrt{81}$

$\sqrt{9 \cdot 9}$

9

2. $\sqrt{36x^2}$

$\sqrt{6 \cdot 6 \cdot x \cdot x}$

$6x$

3. $\sqrt{20x^3yz^4}$

$\sqrt{4 \cdot 5 \, xxx \, y \, zzzz}$

$2xz^2\sqrt{5xy}$

4. $2\sqrt{80p^4}$

$2\sqrt{5 \cdot 16 \, pppp}$

$2 \cdot 4p^2\sqrt{5}$

$8p^2\sqrt{5}$

Simplify the following radical expressions using addition or subtraction. You may have to simplify a radical before you can combine.

"YOU CAN ADD OR SUBTRACT "LIKE" RADICALS.

5. $-11\sqrt{21} + 12\sqrt{21}$

$\sqrt{21}$

6. $-5\sqrt{11} - 10\sqrt{11}$

$-15\sqrt{11}$

7. $2\sqrt{6} + 3\sqrt{54}$

$2\sqrt{6} + 3\sqrt{9 \cdot 6}$

$2\sqrt{6} + 3 \cdot 3\sqrt{6}$

$2\sqrt{6} + 9\sqrt{6}$

$11\sqrt{6}$

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

$-3\sqrt{9 \cdot 2} + 3\sqrt{4 \cdot 2} - \sqrt{4 \cdot 6}$

$-3 \cdot 3\sqrt{2} + 3 \cdot 2\sqrt{2} - 2\sqrt{6}$

$-9\sqrt{2} + 6\sqrt{2} - 2\sqrt{6}$

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

Simplify the following radical expression using multiplication. Your final answer must be completely simplified.

9. $3\sqrt{12} * 1\sqrt{6}$

$3\sqrt{72}$

$3\sqrt{36 \cdot 2}$

$3 \cdot 6\sqrt{2}$ → $18\sqrt{2}$

10. $-4\sqrt{15} * -\sqrt{3}$

$4\sqrt{45}$

$4\sqrt{9 \cdot 5}$

$4 \cdot 3\sqrt{5}$ → $12\sqrt{5}$

Simplify the following radical expression using multiplication. Your final answer must be completely simplified.

11. $\sqrt{20x^2} * \sqrt{20x}$

~~$400\sqrt{x^3}$~~

$\sqrt{400x^3}$

$20x\sqrt{x}$

12. $\sqrt{3v}(\sqrt{6} + 2)$

$\sqrt{8v} + 2\sqrt{3v}$

$\sqrt{4 \cdot 2v} + 2\sqrt{3v}$

$2\sqrt{2v} + 2\sqrt{3v}$

13. $(\sqrt{x} + 4)(\sqrt{x} - 4)$ (COMBINE LIKE TERMS)

$\sqrt{x^2} - 4\sqrt{x} + 4\sqrt{x} - 16$

$x - 16$

Evaluate each function for $x = -1, 1, 2$.

14. $f(x) = 4 \cdot 7^x$

① INPUT INTO GRAPHING CALCULATOR Y=

② CHECK TABLE FOR VALUES

X	Y
-1	.57143
1	28
2	196

15. $y = \frac{2}{3} \cdot 6^x$

X	Y
-1	.11111
1	4
2	24

Without graphing, tell whether the function represents *exponential growth* or *exponential decay*. Then identify the first term and the amount your function is increasing by.

Y= ON YOUR CALCULATOR

16. $y = 6.6 \cdot 2^x$

X=1 Y=13.2

INCREASING BY MULTIPLYING BY 2.

GROWTH BECAUSE EXPONENT IS CONNECTED TO A WHOLE NUMBER WHICH INCREASES THE VALUES EXPONENTIALLY.

17. $g(x) = 7.6\left(\frac{1}{8}\right)^x$

X=1 Y=.95

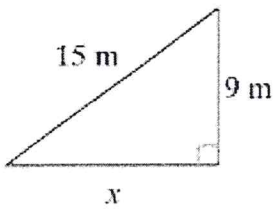
DECREASING BY MULTIPLYING BY 1/8.

DECAY BECAUSE EXPONENT IS CONNECTED TO A FRACTION WHICH DECREASES THE VALUES EXPONENTIALLY.

$a^2 + b^2 = c^2$

Find the missing side of each triangle. Round your answers to the nearest tenth if necessary.

1)



$x^2 + 9^2 = 15^2$

$x^2 + 81 = 225$

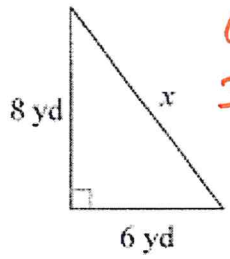
$-81 \quad -81$

$x^2 = 144$

$\sqrt{x^2} = \sqrt{144}$

$\boxed{x = 12}$

2)



$6^2 + 8^2 = x^2$

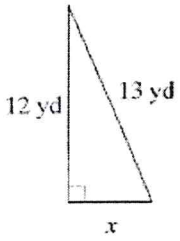
$36 + 64 = x^2$

$100 = x^2$

$\sqrt{100} = \sqrt{x^2}$

$\boxed{10 = x}$

3)



$x^2 + 12^2 = 13^2$

$x^2 + 144 = 169$

$-144 \quad -144$

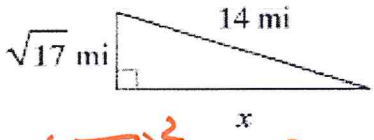
$x^2 = 25$

$\sqrt{x^2} = \sqrt{25}$

$\boxed{x = 5}$

Find the missing side of each triangle. Leave your answers in simplest radical form.

4)



$(\sqrt{17})^2 + x^2 = 14^2$

$17 + x^2 = 196$

$-17 \quad -17$

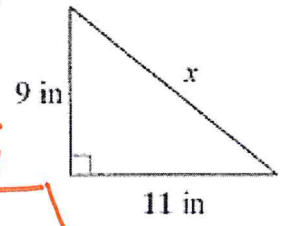
$x^2 = 179$

$\sqrt{x^2} = \sqrt{179}$

$\boxed{x = \sqrt{179}}$

NO OTHER FACTORS

5)



$9^2 + 11^2 = x^2$

$81 + 121 = x^2$

$202 = x^2$

$\sqrt{202} = \sqrt{x^2}$

$\boxed{\sqrt{202} = x}$

NO OTHER FACTORS

Find the missing side of each right triangle. Side *c* is the hypotenuse. Sides *a* and *b* are the legs. Round your answers to the nearest tenth if necessary. $a^2 + b^2 = c^2$

8) $b = 8$ mi, $c = 10$ mi

$a^2 + 8^2 = 10^2$

$a^2 + 64 = 100$

$-64 \quad -64$

$a^2 = 36$

$\sqrt{a^2} = \sqrt{36}$

$\boxed{a = 6}$

9) $b = 12$ ft, $c = 15$ ft

$a^2 + 12^2 = 15^2$

$a^2 + 144 = 225$

$-144 \quad -144$

$a^2 = 81$

$\sqrt{a^2} = \sqrt{81}$

$\boxed{a = 9}$

10) $b = 4$ yd, $c = 5$ yd

$a^2 + 4^2 = 5^2$

$a^2 + 16 = 25$

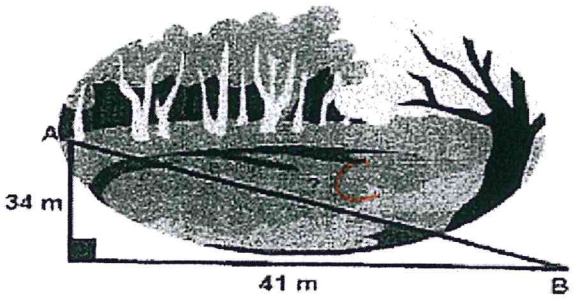
$-16 \quad -16$

$a^2 = 9$

$\sqrt{a^2} = \sqrt{9}$

$\boxed{a = 3}$

1.



To get from point A to point B you must avoid walking through a pond. To avoid the pond, you must walk 34 meters south and 41 meters east. To the *nearest meter*, how many meters would be saved if it were possible to walk through the pond?

$34^2 + 41^2 = c^2$

$1156 + 1681 = c^2$

$2837 = c^2$

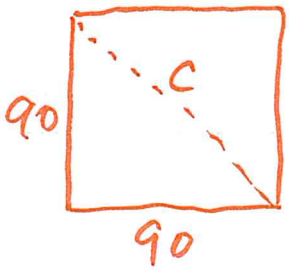
$\sqrt{2837} = c^2$

$53.26349598 = c$

$53 = c$

2.

A baseball diamond is a square with sides of 90 feet. What is the shortest distance, to the *nearest tenth* of a foot, between first base and third base?



$90^2 + 90^2 = c^2$

$8100 + 8100 = c^2$

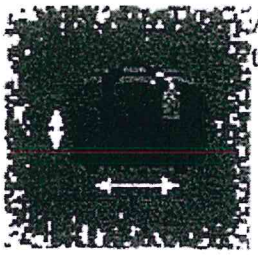
$16,200 = c^2$

$\sqrt{16,200} = \sqrt{c^2}$

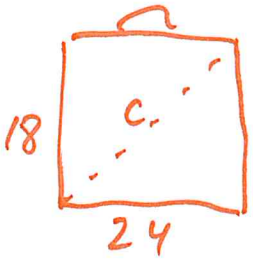
$127.2792206 = c$

$127.3 = c$

3.



A suitcase measures 24 inches long and 18 inches high. What is the diagonal length of the suitcase to the *nearest tenth* of a foot?



$18^2 + 24^2 = c^2$

$324 + 576 = c^2$

$900 = c^2$

$\sqrt{900} = \sqrt{c^2}$

$30 = c$