

Unit 7

Lesson 1

Radicals and Pythagorean Theorem

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QUIZ DATE: _____ **TEST DATE:** _____
Math 2 – Honors Name _____
Unit 7 – Right Triangle Trigonometry Date _____ Pd _____
Lesson 1 → Radicals & Pythagorean Theorem


➤ Review: Simplify each radical

1. $\sqrt{49}$ = 7	2. $\sqrt{121}$ = 11	3. $\sqrt{20}$ $2\sqrt{5}$	4. $\sqrt{24}$ $2\sqrt{6}$
5. $\sqrt{50}$ $5\sqrt{2}$	6. $3\sqrt{40}$ $3 \cdot 2\sqrt{10}$ $6\sqrt{10}$	7. $-2\sqrt{300}$ $\sqrt{3 \cdot 100}$ $-2 \cdot 10\sqrt{3}$ $-20\sqrt{3}$	8. $12\sqrt{50}$ $12 \cdot \sqrt{25} \cdot \sqrt{2}$ $60\sqrt{2}$

20
 $\frac{20}{5}$
 4
 $\frac{24}{6}$
 $\frac{24}{6}$
 $\frac{24}{6}$
 $\frac{50}{5}$
 $\frac{25}{5}$
 $\frac{25}{5}$
 $\frac{40}{2}$
 $\frac{20}{2}$
 $\frac{20}{2}$
 $\frac{300}{3}$
 $\frac{100}{10}$
 $\frac{100}{10}$
 $\frac{50}{5}$
 $\frac{50}{5}$
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<p>9. $\sqrt{4} \cdot \sqrt{4}$ $2 \cdot 2 = 4$</p>	<p>10. $(5\sqrt{3})^2$ $25 \cdot 3 = 75$</p>	<p>11. $\sqrt{10} \cdot \sqrt{8}$ $\sqrt{16} \cdot \sqrt{5}$ $\sqrt{80}$ $4\sqrt{5}$</p>	<p>12. $3\sqrt{2} \cdot 9\sqrt{20}$ 240 $27\sqrt{40}$ 270 $27 \cdot 2\sqrt{10}$ $54\sqrt{10}$</p>
<p>13. $-\sqrt{12} \cdot 6\sqrt{5}$ $-6\sqrt{60}$ $-6 \cdot 2\sqrt{15}$ $-12\sqrt{15}$</p>	<p>14. $4\sqrt{18} \cdot 3\sqrt{2}$ $12\sqrt{36}$ $12 \cdot 6 = 72$</p>	<p>15. $2\sqrt{16} \cdot 3\sqrt{4}$ $6 \cdot 4 \cdot 2 = 48$</p>	<p>16. $-5\sqrt{6} \cdot 4\sqrt{8}$ $-20\sqrt{48}$ $-80\sqrt{3}$</p>

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<p>17. $\frac{\sqrt{36}}{\sqrt{9}}$ $\sqrt{4} = 2$</p>	<p>18. $\frac{8\sqrt{2}}{2\sqrt{2}}$ 4</p>	<p>19. $\frac{\sqrt{150}}{\sqrt{3}}$ $5\sqrt{2}$ $\sqrt{50}$</p>	<p>20. $\frac{\sqrt{300}}{\sqrt{5}}$ $2\sqrt{15}$ $\sqrt{60}$</p>
<p>21. $\frac{2\sqrt{33}}{\sqrt{11}}$ $2\sqrt{3}$</p>	<p>22. $\frac{8\sqrt{48}}{2\sqrt{3}}$ $4\sqrt{16} = 16$</p>	<p>23. $\frac{\sqrt{25}}{\sqrt{36}}$ $\frac{5}{6}$</p>	<p>24. $\frac{35\sqrt{108}}{7\sqrt{6}}$ $5\sqrt{18}$ $15\sqrt{2}$ $\frac{218}{318}$</p>

➤ What happens if a radical is left in the denominator of a fraction?


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25. $\frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$ $\frac{2\sqrt{3}}{3}$	26. $\frac{15}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{15\sqrt{5}}{5}$ $3\sqrt{5}$	27. $\frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$	28. $\frac{6}{2\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}}$ $\frac{6\sqrt{7}}{14} = \frac{3\sqrt{7}}{7}$
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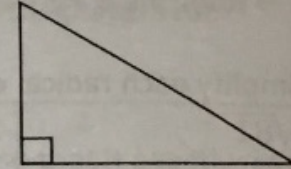
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29. $\frac{8}{3\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$ $\frac{8\sqrt{2}}{6}$ $\frac{4\sqrt{2}}{3}$	30. $\frac{18}{\sqrt{27}} \cdot \frac{\sqrt{27}}{\sqrt{27}}$ $\frac{18\sqrt{27}}{27}$ $\frac{18 \cdot 3\sqrt{3}}{27}$ $\frac{54\sqrt{3}}{27}$ $2\sqrt{3}$	31. $\frac{1}{3\sqrt{16}} \cdot \frac{\sqrt{16}}{\sqrt{16}}$ $\frac{4}{48} = \frac{1}{12}$	32. $\frac{5\sqrt{2}}{\sqrt{6}} \cdot \frac{\sqrt{6}}{\sqrt{6}}$ $\frac{5\sqrt{12}}{6}$ $\frac{10\sqrt{3}}{6}$ $\frac{5\sqrt{3}}{3}$
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Recall the Pythagorean Theorem:

- ✓ $a^2 + b^2 = c^2$
- ✓ Used to find a missing side of a right triangle.
- ✓ a and b represent the legs of the right triangle.
- ✓ c represents the hypotenuse of the right triangle.



Examples: Solve for the missing side in each right triangle.

1. $3^2 + 6^2 = c^2$
 $9 + 36 = c^2$
 $45 = c^2$
 $c = \sqrt{45} = 3\sqrt{5}$

2. $49 + 9 = c^2$
 $\sqrt{58} = c$

3. $a^2 + 5^2 = 10^2$
 $a^2 + 25 = 100$
 $-25 \quad -25$
 $a^2 = 75$
 $a = \sqrt{75}$
 $a = 5\sqrt{3}$

4. $42.25 + b^2 = 98.01$
 $-42.25 \quad -42.25$
 $b^2 = 55.76$
 $b = \sqrt{55.76}$

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5. Determine whether the measures of the sides of each triangle would represent a right triangle:

A. 9, 16, 20

$9^2 + 16^2 = 20^2$
No

B. 11, 12, 15

No

C. 18, 24, 30

Yes

D. 2, 3, 5

No

E. 5, 12, 13

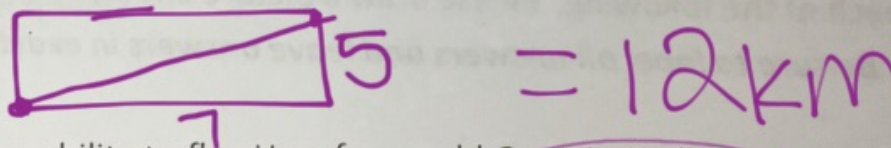
Yes

F. 15, $\sqrt{31}$, 16

Yes

Michael is walking around a rectangular crater in the center of Wake Forest. The crater is 5 km long and 7 km wide.

a. How far would Michael have to walk from one corner of the crater to the opposite corner of the crater along the outside of the crater?



b. Captain Pythagoras has the ability to fly. How far would Captain Pythagoras fly if he were to fly from one corner of the crater to the opposite corner of the crater?

$7^2 + 5^2 = 74$ $c = \sqrt{74} \approx 8.6$ km

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