Warm-Up 8/25/17

1. Mark has 12 comic books, Jeremy has 14 comic books, and Sam has half as many comic books as Jeremy. $\frac{1}{2} \times 14$ or $\frac{14}{2} = 7$

Write a numerical expression to represent how many comic books the three boys have together.

$12 + 14 + 7 = 33$

$12 + 14 + \left(\frac{1}{2} \cdot 14\right)$

2. Use the distributive property to simplify the following expressions:

a. $2(n + 5 + 12)$

b. $-5(x + 4) + 2(-2x - 3)$

$2(n+5+12)$

$2n+10+24$

$2n+34$

$-5(x+4)+2(-2x-3)$

$-5x-20-4x-6$

$-9x-26$

https://www.youtube.com/watch?v=nbopLhP4kpo

8/25/17

Essential Question

How can I use the Pythagorean Theorem to solve real world problems?

Opening 8/25/17

Can we correct the scarecrow???

http://robertkaplinsky.com/work/wizard-of-oz/

- How can we determine if the Scarecrow is correct when he mentions "any two sides"?

INB

Vocabulary

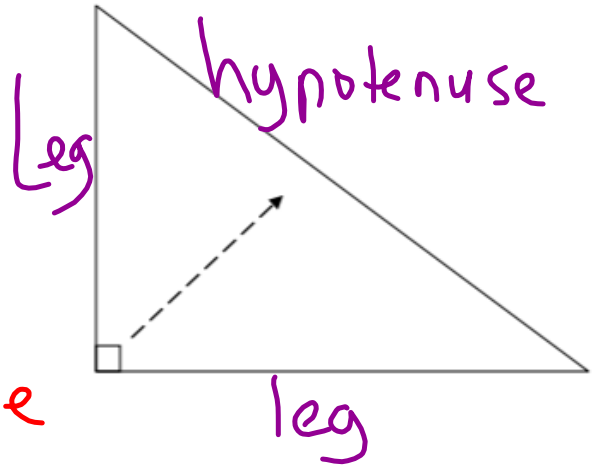
Right Angle
An angle which measures 90°

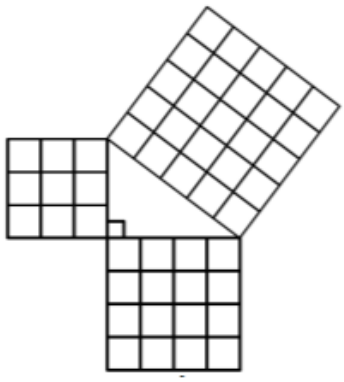
Leg 2 sides of a right triangle and connected by the right angle

Hypotenuse The longest side of a right triangle.

Square Root A # that produces a specific quantity when multiplied by itself.

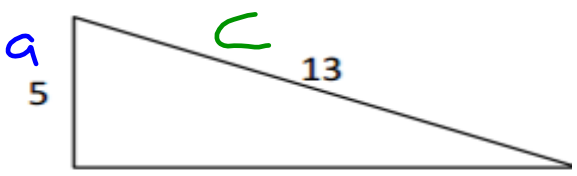
Pythagorean Theorem





Solve to see if it's a right triangle

Example 1



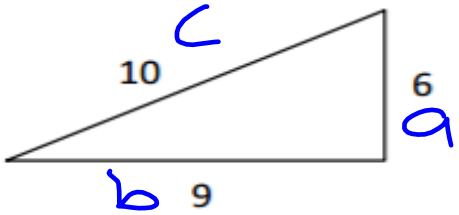
$a^2 + b^2 = c^2$

$25 + 144 = 169$

$169 = 169$ ✓

Yes, it is a right triangle

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



$6^2 + 9^2 = 10^2$

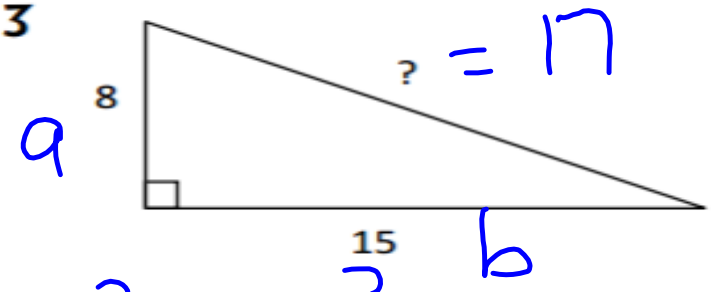
$36 + 81 = 100$

$117 \neq 100$

This is not a right triangle

Solve for the length of the hypotenuse

Example 3



$? = 17$

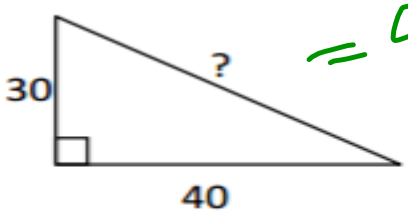
a b c

$8^2 + 15^2 = c^2$

$64 + 225 = 289$

$c = \sqrt{289} = \boxed{17}$

Example 4



$= 50$

$30^2 + 40^2 = c^2$

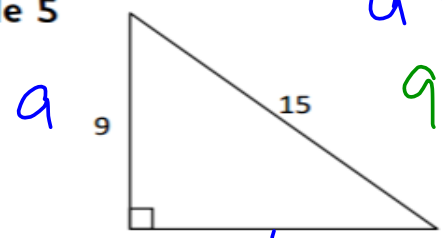
$900 + 1600 = 2500$

$c = \sqrt{2500} = 50$

Solve for the length of a leg

(subtract)

Example 5



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

$9^2+b^2=15^2$

$81+b^2=225$

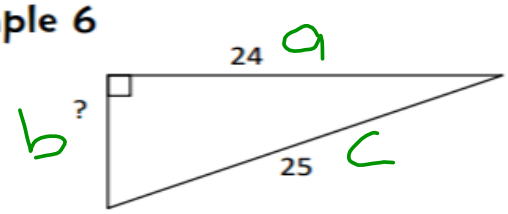
$-81 \quad -81$

$b^2=144$

$b=\sqrt{144}$

$b=\boxed{12}$

Example 6



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

$24^2+b^2=25^2$

$576+b^2=625$

$-576 \quad -576$

$b^2=49$

$\sqrt{b^2}=\sqrt{49}=\boxed{7}$

A. Number Properties and Algebraic Expressions

Simplify the following expressions:

1. $7b - 3b + 4$

$4b + 4$

2. $9x + x - 4x + x$

$7x$

3. $6a - 3a - a - 12$

$2a - 12$

4. $-3(25x)$

$-75x$

5. $8(y - 4)$

$8y - 32$

6. $-8(3y + 5) - 5$

$-24y - 40 - 5$

$-24y - 45$

7. $8x + 4(x - 1)$

$8x + 4x - 3$

$12x - 3$

8. $7(x + 5)$

$7x + 35$

9. $4(3 + 9) + 10a - 4a$

$12 + 36 + 6a$

$48 + 6a$

10. $(21 \div 7)(4a + a) - 12$

3×4

$12a + 3 - 15a$

$15a - 12$

Write algebraic expressions for the following:

11. Add one-half to 5 times c

$\frac{1}{2} + 5c$

12. One-fourth of b is added to 9

$9 + \frac{1}{4}b$

13. 7 is subtracted from two-fifths of y

$\frac{2}{5}y - 7$

14. 9 less than 4 times q

$4q - 9$

15. One-fourth of the sum of 6 and f

$\frac{1}{4}(6+f)$

16. Four-fifths of q is subtracted from 6

$6 - \frac{4}{5}q$

Name the number property indicated below:

17. $34 + 27 = 27 + 34$

18. $48 + (73 + 16) = (48 + 73) + 16$

19. $18 \times (22 \times 49) = (18 \times 22) \times 49$

20. $66 \times 37 = 37 \times 66$

21. $7+2+3=2+3+7$

22. $(6 \times 5) \times 2 = 6 \times (5 \times 2)$

23. $7 \times 8 \times 4 = 8 \times 4 \times 7$

24. $6 + (9 + 12) = (6 + 9) + 12$

B. Exponent Properties

I. Use the properties of exponents to simplify the following expressions.

1. $(x^3y^4)(x^2y^5)$

x^5y^9

2. $(x^2y)^3$

x^6y^3

3. $(x^6y^2z^{15})^0$

$x^0y^0z^0$

$= 1$

6. $\frac{x^{2y}}{x^y}$

$= x^{2y-y}$

$= x^y$

7. $\frac{3x^3y^8}{81x^4y^5}$

$= \frac{1x^{-1}y^3}{27}$

$= \frac{y^3}{27x}$

8. $(2^x)(2^x)$

$= 2^{x+x}$

$= 2^{2x}$

4. $(x^7)^y$

$= x^{7y}$

9. $2^x + 2^x$

4^x

5. $(x^{2y})(x^{3y})$

x^{5y}

10. $\frac{3^x + 3^x}{3^x}$

$\frac{6^x}{3^x}$ or $\left(\frac{6}{3}\right)^x$

II. Simplify the expression. Leave answers written in exponential form.

1. $3^4 \cdot 3^6$ $= 3^{10}$

2. $x^3 \cdot x^8$

3. $(5^4)^3$ 5^{12}

4. $(y^2)^7$

5. $(3b)^2(2b^3)^4$

$= (3^2 b^2)(2^4 b^{12})$

$= 9b^2 \cdot 16b^{12}$ same base

$= 144b^{14}$

6. $r^4(4r^2s^2)^3$

$r^4(4^3 r^6 s^6)$ same base

$64r^{10}s^6$

III. Evaluate the expression.

7. $47^0 = 1$

8. $(128xyz)^0$

9. $5^{-2} = \frac{1}{5^2} = \boxed{\frac{1}{25}}$

12. $(-2)^{-4} = \frac{1}{(-2)^4}$

$= \boxed{\frac{1}{16}}$

13. $\left(\frac{1}{2}\right)^{-1} = \frac{2}{1} = \boxed{2}$

14. $\frac{1}{9^{-1}}$

$= \boxed{9}$

IV. Simplifying Expressions: Rewrite the expression with positive exponents.

15. $m^5 n^{-5} = \frac{m^5}{n^5}$

16. $\frac{13}{x^{-4}} = 13x^4$

17. $\frac{x^{-5}}{y^{-2}} = \frac{y^2}{x^5}$

18. $(2y)^{-5} = \frac{1}{(2y)^5}$

$= \frac{1}{2^5 y^5} = \frac{1}{32y^5}$

V. Simplify the quotient and expressions

19. $\frac{7^4}{7^5} = 7^{4-5} = 7^{-1} = \boxed{\frac{1}{7}}$

20. $\frac{m^6}{m^3} = m^{6-3} = \boxed{m^3}$

21. $\left(\frac{2}{3}\right)^3 = \frac{2^3}{3^3} = \boxed{\frac{8}{27}}$

22. $\left(\frac{c}{6}\right)^{-2}$ $\frac{6^2}{c^2} = \boxed{\frac{36}{c^2}}$

23. $\frac{\cancel{4}^{2}x^{3}}{\cancel{2}xy} \cdot \frac{5xy^{2}}{2y} = \frac{2x^2}{y} \cdot \frac{5xy}{2}$

$= \frac{10x^3y^2}{2y} = \boxed{5x^3}$

24. $\left(\frac{2a^4b^5}{5a^2b}\right)^3$

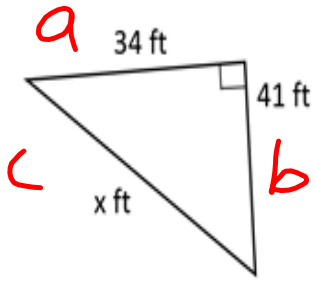
$\frac{2^3a^{12}b^{15}}{5^3a^6b^3}$

$= \frac{8a^{12}b^{15}}{125a^6b^3}$

$= \frac{8a^6b}{125}$

C. Pythagorean Theorem (add)

1. Find the missing side



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

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

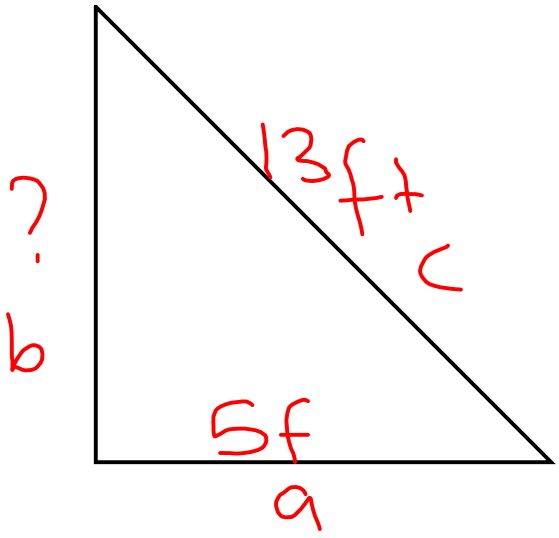
$1156 + 1681 = 2837$

$c = \sqrt{2837}$

$c = 53.3$ ft

2. A ladder is 13 ft long leaning against the wall. The bottom is 5 ft from the wall. What is the height of the wall? (HINT: DRAW A PICTURE)

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



$5^2+b^2=13^2$

$25+b^2=169$

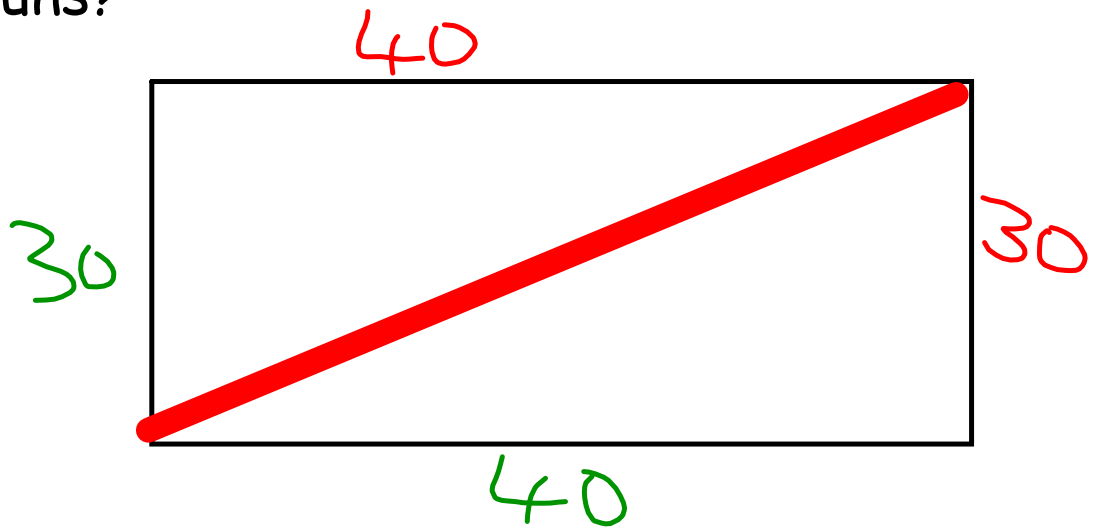
$-25 \quad -25$

$b^2=144$

$b=\sqrt{144}$

$b=12\text{ ft}$

3. Tanya runs diagonally across a rectangular field that has a length of 40 yards and a width of 30 yards. What is the length of the diagonal, in yards, that Tanya runs?



This is the same as example 4 in your pink pythagorean theorem foldable.

Closing 8/25/17

Review study guide questions.

Attachments

Exponent Properties - Practice 8-24-16.ks-ipa