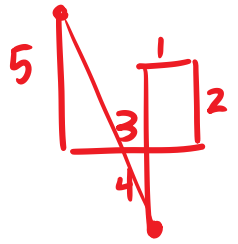
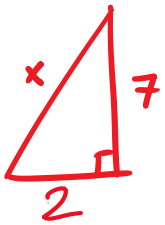
Chapter 9 review Numbers game!

1) Chris can't decide where he's going! First he bikes 5 miles South, then 3 miles East, 2 miles North, 1 mile west, then finally 4 miles South. How far is he from the where he started.



ans: $\sqrt{53}$



$2^2+7^2=x^2$

$4+49=x^2$

$53=x^2$

$\pm\sqrt{53}=x$

2) Given triangles with the following side lengths, determine if each is acute, obtuse, right, or none.

a. 4, 5, 8

$8^2 \bigcirc 4^2+5^2$

$64 \bigcirc 16+25$

$64 > 41$

obtuse

b. 12, 8, 25

not a triangle

$12+8 \not> 25$

c. $2\sqrt{5},\ 4\sqrt{7},\ 5\sqrt{3},$

↑ longest

$(4\sqrt{7})^2 \bigcirc (2\sqrt{5})^2+(5\sqrt{3})^2$

$16\cdot 7 \bigcirc 4\cdot 5+25\cdot 3$

$112 > 95$ obtuse

3) a. $2\sqrt{3675}$

$2\sqrt{1225\cdot 3}$

$2\cdot 35\sqrt{3}$

$70\sqrt{3}$

b. $2\sqrt{50}-\sqrt{75}+5\sqrt{100}-\sqrt{54}$

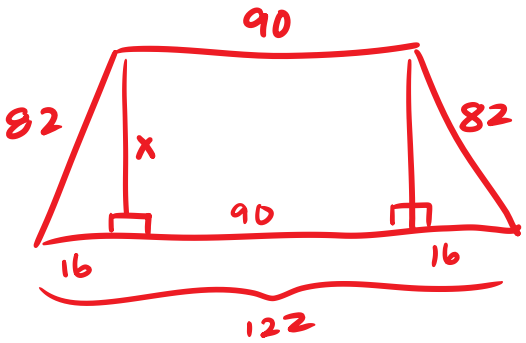
$2\sqrt{25\cdot 2}-\sqrt{25\cdot 3}+5\cdot 10-\sqrt{9\cdot 6}$

$10\sqrt{2}-5\sqrt{3}+50-3\sqrt{6}$

↑ no 'like' term

c. $\frac{8\sqrt{3}}{\sqrt{2}}\cdot\frac{\sqrt{2}}{\sqrt{2}}=\frac{8\sqrt{6}}{2}=4\sqrt{6}$

4) An isosceles trapezoid has sides with lengths 82, 90, 82, 122. Find the altitude.



$x^2+16^2=82^2$

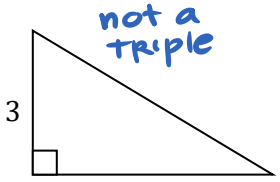
$x^2=6468$

$x^2=\sqrt{196\cdot 33}$

$x=\pm 14\sqrt{33}$

height: $14\sqrt{33}$

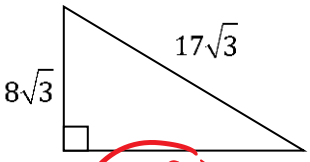
5) Find the missing lengths in the following triangles. Do NOT use Pythagorean Theorem unless it is necessary!



not a triple

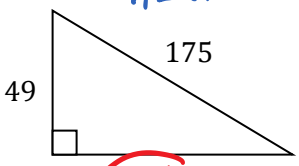
$3^2+5^2=x^2$

$x=\sqrt{34}$



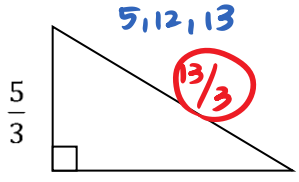
8, 15, 17

$15\sqrt{3}$



7, 24, 25

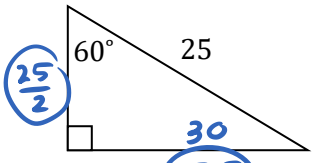
168



5, 12, 13

$\frac{13}{3}$

$\frac{12}{3}$

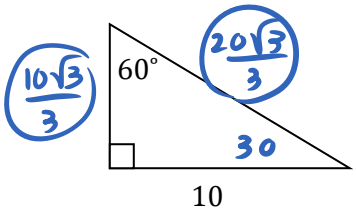


$\frac{25}{2}$

$\frac{25\sqrt{3}}{2}$

$2x=25$

$x=\frac{25}{2}$

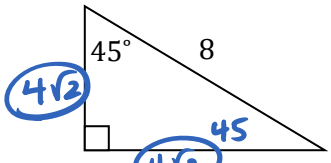


$\frac{10\sqrt{3}}{3}$

$\frac{20\sqrt{3}}{3}$

$\frac{x\sqrt{3}}{\sqrt{3}}=\frac{10}{\sqrt{3}}\cdot\frac{\sqrt{3}}{\sqrt{3}}$

$x=\frac{10\sqrt{3}}{3}$



$4\sqrt{2}$

$4\sqrt{2}$

$\frac{x\sqrt{2}}{\sqrt{2}}=\frac{8}{\sqrt{2}}\cdot\frac{\sqrt{2}}{\sqrt{2}}$

$x=4\sqrt{2}$

6) The distance between (-3, 4) and (6, x) is 10 units. Find the value of x

$10=\sqrt{(6+3)^2+(x-4)^2}$

$(10)^2=\left(\sqrt{9^2+(x-4)^2}\right)^2$

$100=81+x^2-8x+16$

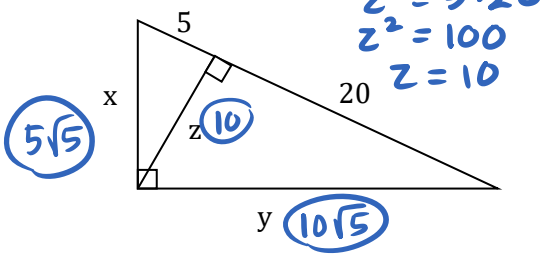
$0=x^2-8x-3$

$x=\frac{8\pm\sqrt{64-4(1)(-3)}}{2(1)}$

$x=\frac{8\pm\sqrt{64+12}}{2}$

$x=\frac{8\pm\sqrt{76}}{2}$ so $\frac{8+\sqrt{76}}{2}$

7) Find the missing variables in the following triangles.



$z^2=5\cdot20$

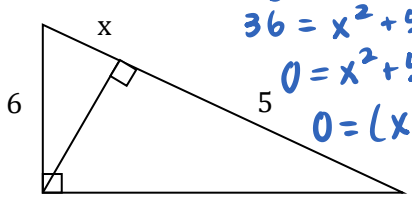
$z^2=100$

$z=10$

$5\sqrt{5}$

10

$10\sqrt{5}$



$6^2=x(x+5)$

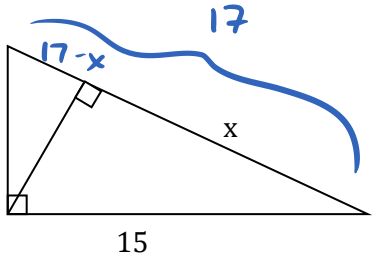
$36=x^2+5x$

$0=x^2+5x-36$

$0=(x+9)(x-4)$

$x=-9, 4$

$x=4$

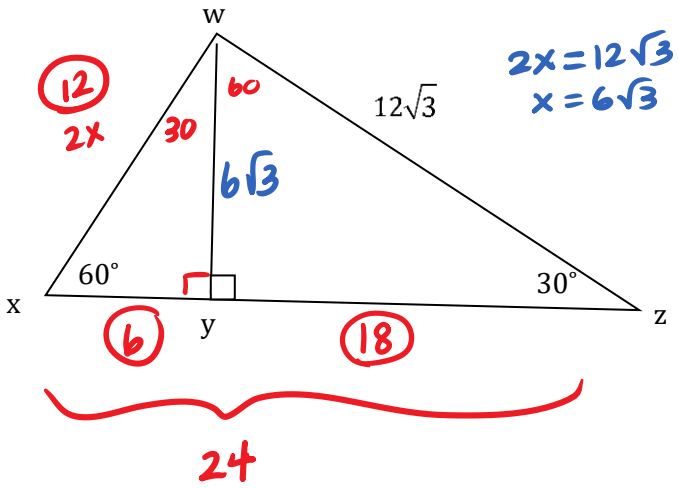


$15^2=x\cdot17$

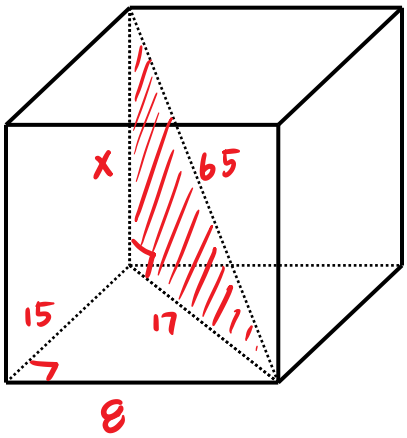
$225=17x$

$x=\frac{225}{17}$ or $13\frac{4}{17}$

8) Find all missing lengths.



9) If a rectangular prism has a rectangular base with sides of 8 and 15, and a diagonal of the prism is 65, what is the height of the prism?



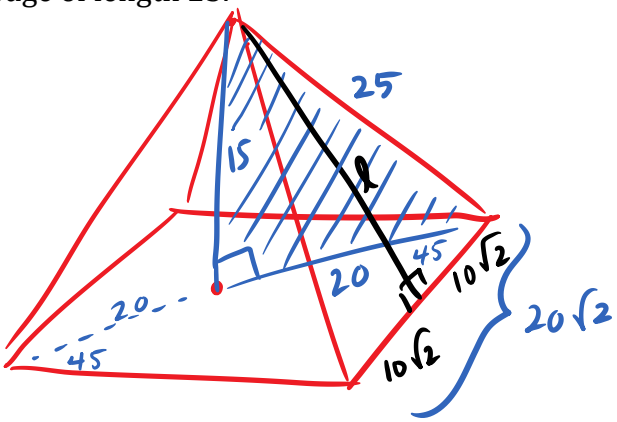
$x^2 + 17^2 = 65^2$

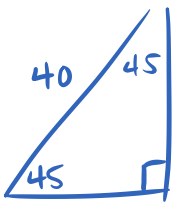
$x^2 = 3936$

$x^2 = \sqrt{16 \cdot 246}$

$x = 4\sqrt{246}$

10) Find the slant height of a square pyramid that has an altitude of length 15 and a lateral edge of length 25.





$\frac{x\sqrt{2}}{\sqrt{2}} = \frac{40}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

$x = 20\sqrt{2}$

$l^2 + (10\sqrt{2})^2 = 25^2$

$l^2 + 100(2) = 625$

$l^2 = 425$

$l = 5\sqrt{17}$