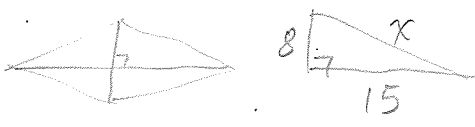


1. The diagonals of a rhombus are 30 and 16. Find the perimeter.



$$8^2 + 15^2 = x^2$$

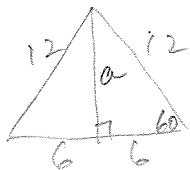
$$64 + 225 = x^2$$

$$289 = x^2$$

$$x = 17$$

$$\text{Perimeter} = 68 \text{ units}$$

2. Each side of an equilateral triangle is 12. Find the altitude to one side.



$$6^2 + a^2 = 12^2$$

OR $\sin 60 = \frac{a}{12}$

$$a^2 = 108$$

$$a = 6\sqrt{3}$$

$$a \approx 10.3923$$

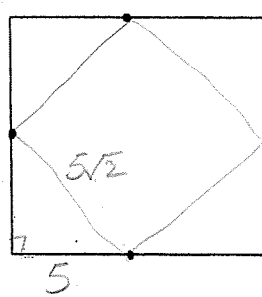
$$\approx 10.4$$

3. The square shown has side length of 10 cm. Find the perimeter of the figure formed by joining the consecutive midpoints of the square.

$$4(5\sqrt{2}) = 20\sqrt{2}$$

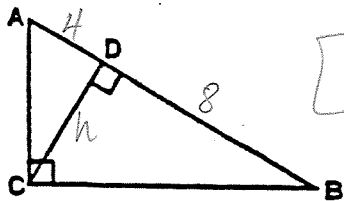
$$\text{Area} = 20\sqrt{2} \text{ cm}$$

$$\approx 28.3 \text{ cm}$$



4. Given: AD = 4
BD = 8

Find CD.



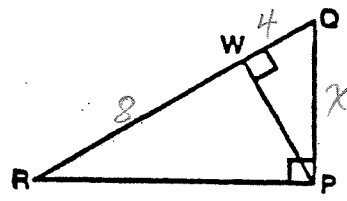
$$\frac{4}{h} = \frac{h}{8}$$

$$h^2 = 32$$

$$h = 4\sqrt{2}$$

5. Given: WQ = 4
WR = 8

Find QP.



$$\frac{12}{x} = \frac{x}{4}$$

$$x^2 = 48$$

$$x = 4\sqrt{3}$$

5. Find the length of the longest diagonal in a rectangular box that is 8 x 9 x 12.

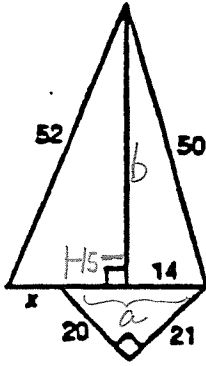
$$d = \sqrt{8^2 + 9^2 + 12^2}$$

$$= \sqrt{289}$$

$$d = 17$$

6. Solve for x.

a.



$$20^2 + 21^2 = a^2$$

$$841 = a^2$$

$$a = \sqrt{841} = 29$$

$$b^2 + 14^2 = 50^2$$

$$b^2 = 2304$$

$$2304 + y^2 = 52^2$$

$$y^2 = 400$$

$$y = 20$$

$$20 - 15 = x$$

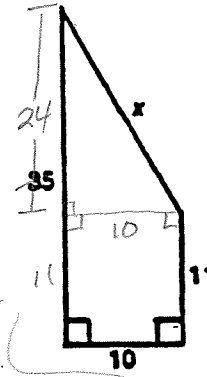
$$x = 5$$

OR
do as
a
quadratic
EQ:

$$(x+15)^2 + 2304 = 52^2$$

$$x = 5$$

b.

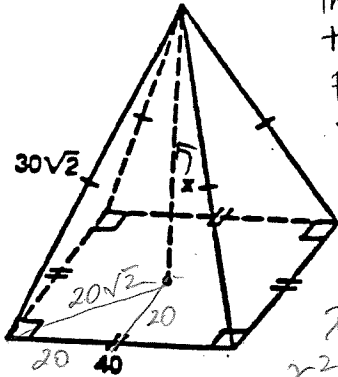


$$24^2 + 10^2 = x^2$$

$$x^2 = 676$$

$$x = 26$$

c.



The altitude of this square pyramid x passes through the intersection of the diagonals of the square base.

$$x^2 + (20\sqrt{2})^2 = (30\sqrt{2})^2$$

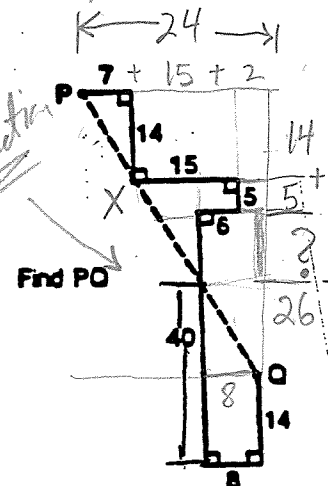
$$x^2 + 800 = 1800$$

$$x^2 = 1000$$

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

d.

Connect



Find PQ

$$7^2 + 14^2 = (PK)^2$$

$$245 = PK^2$$

$$PK = 7\sqrt{5}$$

$$\frac{7}{7\sqrt{5}} = \frac{24}{PQ}$$

$$7PQ = 24(7)\sqrt{5}$$

$$PQ = 24\sqrt{5}$$

7. What is the ratio of the sides of the following triangles:

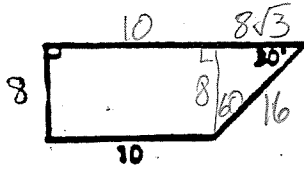
a. 45 - 45 - 90

$$1 : 1 : \sqrt{2}$$

b. 30 - 60 - 90

$$1 : \sqrt{3} : 2$$

8. Find the perimeter of the trapezoid.



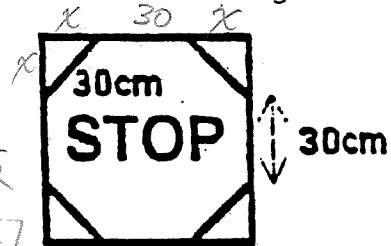
$$P = 44 + 8\sqrt{3}$$

9. Find the dimensions of the square sheet of metal from which this regular octagonal stop sign was cut.

$$x\sqrt{2} = 30$$

$$x = \frac{30}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{30\sqrt{2}}{2} = 15\sqrt{2}$$

$$2(15\sqrt{2}) + 30 = 30 + 30\sqrt{2}$$



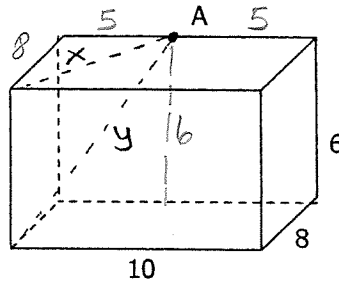
10. If point A is the midpoint of one edge, find lengths x and y.

$$8^2 + 5^2 = x^2 \quad y = \sqrt{6^2 + 8^2 + 5^2}$$

$$x = \sqrt{89}$$

$$y = \sqrt{125}$$

$$y = 5\sqrt{5}$$



11. Would a triangle with the following lengths for its sides be right, obtuse, acute or impossible?

a. 6, 9, 3

b. $\sqrt{8}, \sqrt{3}, \sqrt{3}$

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

d. $17x + 1, 15x, 8x + 1$

NOT

Possible

$$3 + 3 > 8$$

$$6 < 8$$

obtuse

$$5 + 3 > 7$$

$$8 > 7$$

acute

$$(15x)^2 + (8x+1)^2 > (17x+1)^2$$

$$225x^2 + 64x^2 + 16x + 1$$

$$289x^2 + 16x + 1 < 289x^2 +$$

$$16x < 34x \quad 34x >$$

obtuse

12. Find the length of the altitude to the hypotenuse.

$$\frac{17}{8} = \frac{8}{a}$$

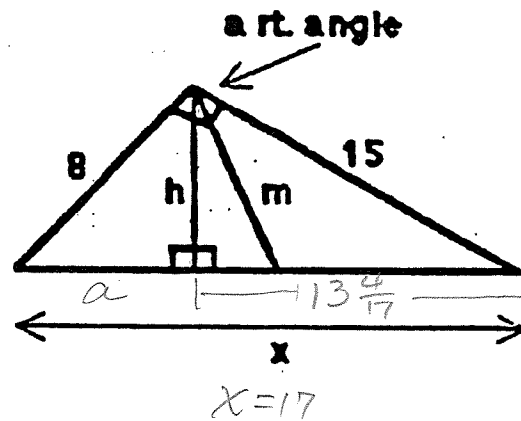
$$17a = 64$$

$$a = \frac{64}{17}$$

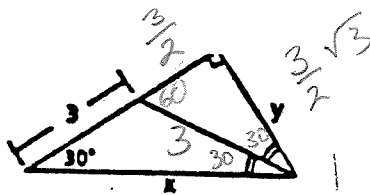
$$\frac{225}{17} = \frac{h}{\frac{64}{17}}$$

$$h^2 = \frac{225}{17} \cdot \frac{64}{17}$$

$$h = \frac{120}{17}$$



13. Find x and y.



$$(3 + 1.5)^2 + \left(\frac{3}{2}\sqrt{3}\right)^2 = x^2$$

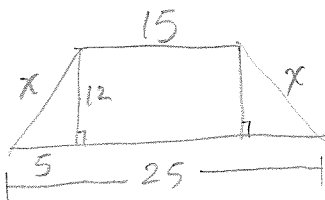
$$20.25 + \frac{9}{4}(3) = x^2$$

$$27 = x^2$$

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

$$y = \frac{3\sqrt{3}}{2}$$

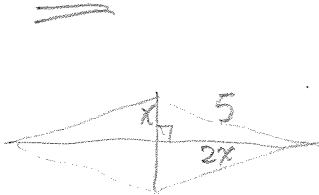
14. Find the legs of an isosceles trapezoid whose bases are 15 and 25 and whose height is 12.



$$5^2 + 12^2 = x^2$$

$$x = 13$$

15. The diagonals of a rhombus have a length ratio of 2:1. If the perimeter is 20, find the sum of the lengths of the diagonals.



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

$$x^2 + 4x^2 = 25$$

$$5x^2 = 25$$

$$x^2 = 5$$

$$x = \sqrt{5}$$

$$\text{short} = 2\sqrt{5}$$

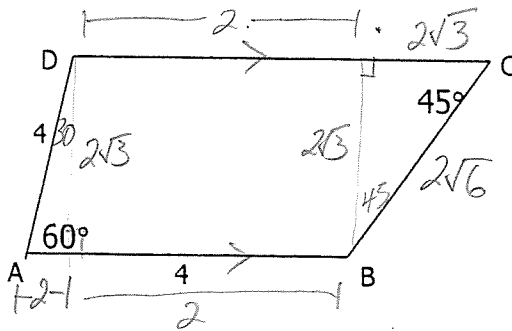
$$\text{long} = 4\sqrt{5}$$

$$\text{Sum} = 6\sqrt{5}$$

16. $ABCE$ is a trapezoid, $\overline{DC} \parallel \overline{AB}$. Find DC and BC .

$$DC = 2 + 2\sqrt{3}$$

$$BC = 2\sqrt{6}$$



17. Find the length of the altitude.

$$x^2 + h^2 = 100$$

$$h^2 = 100 - x^2$$

$$h^2 + (21-x)^2 = 17^2$$

$$h^2 = 289 - (441 - 42x + x^2)$$

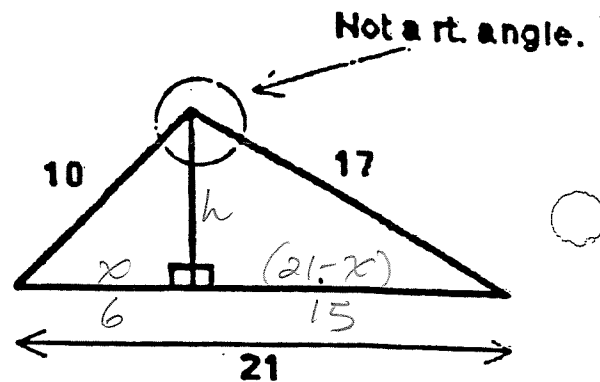
$$h^2 = -x^2 + 42x - 152$$

$$100 - x^2 = -x^2 + 42x - 152$$

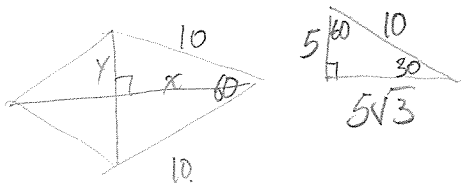
$$252 = 42x$$

$$6 = x$$

$$h = 8$$



18. Find the length of the diagonals of a rhombus that has a perimeter of 40 cm and one interior angle of 60° .



Short diagonal = 10
 long diag. = $10\sqrt{3}$

