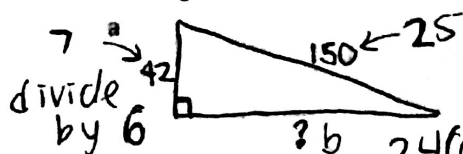


Similarity and Trigonometric Ratios Review

Make sure you look over your quizzes and your other reviews as well

1) Find the missing side of each triangle.



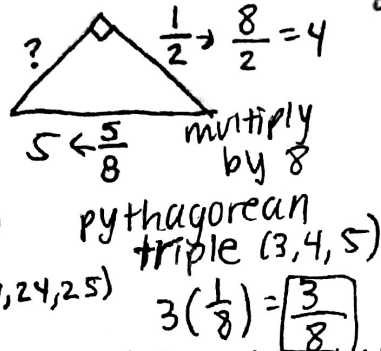
$$7^2 + b^2 = 25^2$$

$$49 + b^2 = 625$$

$$b^2 = 576$$

$$b = \pm 24$$

pythagorean triple (7, 24, 25)



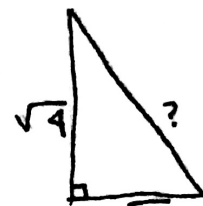
$$5^2 + b^2 = 17^2$$

$$25 + b^2 = 289$$

$$b^2 = 264$$

$$b = \pm \sqrt{264}$$

pythagorean triple (3, 4, 5)



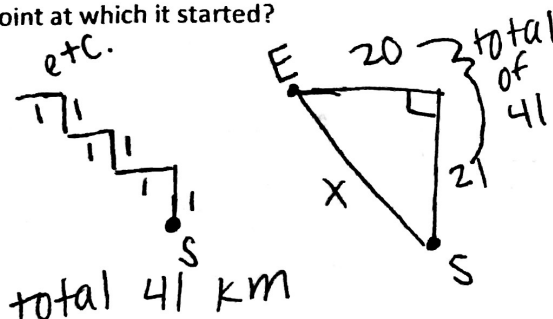
$$(\sqrt{4})^2 + (\sqrt{3})^2 = c^2$$

$$4 + 3 = c^2$$

$$7 = c^2$$

$$c = \sqrt{7}$$

2) A submarine travels an evasive course, trying to outrun a destroyer. It travels 1 km north, then 1 km west, then 1 km north, then 1 km west, and so forth, until it has traveled a total of 41 km. How many kilometers is the sub from the point at which it started?



$$20^2 + 21^2 = X^2$$

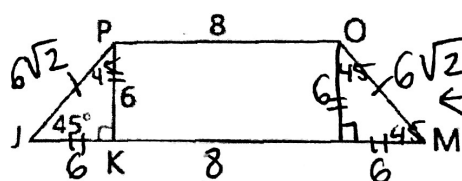
$$400 + 441 = X^2$$

$$841 = X^2$$

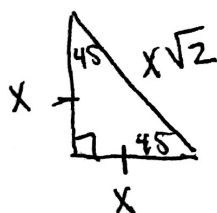
$$X = \pm 29$$

the sub is 29 km from the point where it started

3) Given: PK is an altitude of isosceles trapezoid JMOP.
PK = 6, PO = 8, $\angle J = 45^\circ$
Find: The perimeter of JMOP



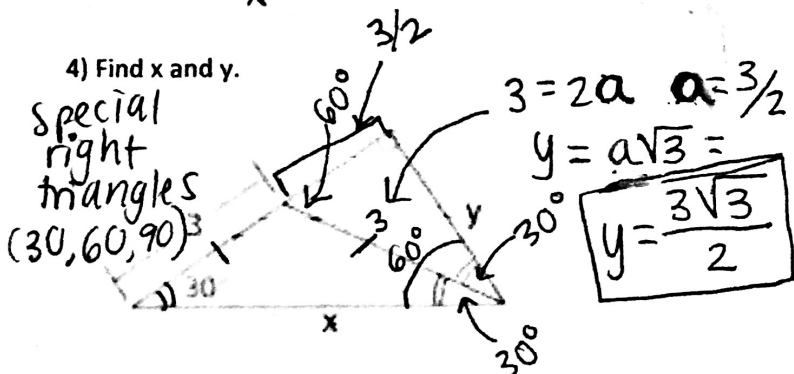
special right triangle (45, 45, 90)



$$6\sqrt{2} + 6 + 8 + 6 + 6\sqrt{2} + 8 =$$

$$12\sqrt{2} + 28$$

4) Find x and y.



$$3 = 2a$$

$$a = \frac{3}{2}$$

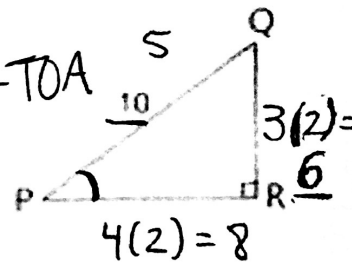
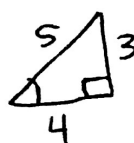
$$y = a\sqrt{3} = \frac{3\sqrt{3}}{2}$$

$$x = 2y = 2\left(\frac{3\sqrt{3}}{2}\right)$$

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

5) Given: $\sin \angle P = \frac{3}{5}$, PQ = 10
Find: $\cos \angle P$

SOH-CAH-TOA



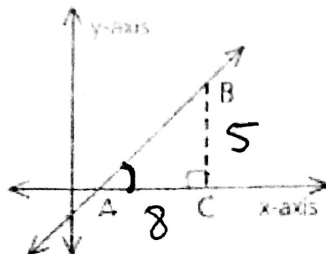
$$\cos \angle P = \frac{8}{10} = \frac{4}{5}$$

- 6) If the slope of \vec{AB} is $\frac{5}{8}$, find the tangent of $\angle BAC$.

$$m = \frac{5}{8} = \frac{\Delta y}{\Delta x}$$

SOH-CAH-TOA

$$\tan \angle BAC = \boxed{\frac{5}{8}}$$



- 7) Find, to the nearest degree, the angles of a (3, 4, 5) triangle.

SOH-CAH-TOA

$$\sin x = \frac{4}{5}$$

$$x = \sin^{-1}(\frac{4}{5}) \approx 53.13$$

$$x = 53^\circ$$

★ to find angles, we need to use Inverse ★

$$y = 180 - 90 - 53 = 37^\circ$$

★ Remember to

put calculators in degrees ★

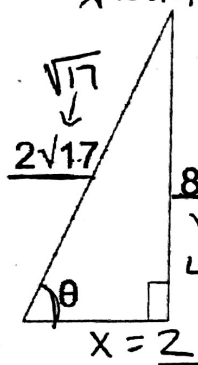
$$\boxed{37^\circ, 53^\circ, 90^\circ}$$

- 8) Evaluate the trigonometry values for angle θ .

$$\sin \theta = \frac{8}{2\sqrt{17}} = \frac{4}{\sqrt{17}} \cdot \frac{\sqrt{17}}{\sqrt{17}} = \boxed{\frac{4\sqrt{17}}{17}}$$

$$\cos \theta = \frac{2}{2\sqrt{17}} = \frac{1}{\sqrt{17}} \cdot \frac{\sqrt{17}}{\sqrt{17}} = \boxed{\frac{\sqrt{17}}{17}}$$

$$\tan \theta = \frac{8}{2} = \boxed{4}$$



← divide everything by 2

$$4^2 + x^2 = (\sqrt{17})^2$$

$$16 + x^2 = 17$$

$$x^2 = 1 \quad x = (\pm 1) \cdot 2$$

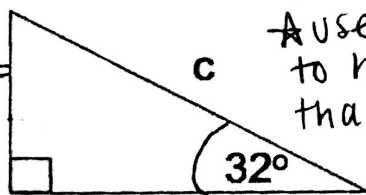
$$x = \pm 1 = 2$$

- 9) Find all angles and sides of the following triangles:

a)

$$\angle B = 180 - 90 - 32 = 58$$

$$\boxed{\angle B = 58^\circ}$$



SOH-CAH-TOA

★ use given information to have answers that are more accurate ★

$$b = 11$$

adjacent → use cosine and tangent

$$\cos 32 = \frac{11}{c}$$

← cross multiply

$$\frac{\cos 32}{1} = \frac{11}{c}$$

$$\tan 32 = \frac{a}{11}$$

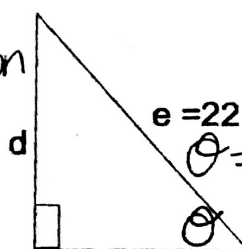
$$11 \tan 32 = a$$

$$\frac{c \cos 32}{\cos 32} = \frac{11}{\cos 32}$$

$$c = \frac{11}{\cos 32}$$

$$\boxed{c \approx 12.97}$$

$$\boxed{a \approx 6.87}$$



$$\cos \theta = \frac{13}{22}$$

$$\theta = \cos^{-1}(\frac{13}{22})$$

$$\theta \approx 53.78$$

$$f = 13$$

$$\boxed{\theta = \angle D = 54^\circ}$$

$$\angle F = 180 - 90 - 54 = 36$$

$$\boxed{\angle F = 36^\circ}$$

$$13^2 + d^2 = 22^2 \quad \sqrt{315}$$

$$169 + d^2 = 484$$

$$d^2 = 315$$

$$d = \pm \sqrt{315}$$

$$d = \pm 3\sqrt{35}$$

$$\boxed{d = 3\sqrt{35}}$$