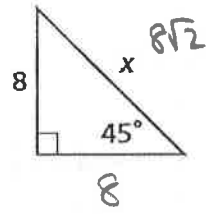
Geometry CH 8-9 Review Name: KEY Blk___ Date:

Use special right triangles to find the missing variable in each triangle. Then, find the area and perimeter of each triangle.

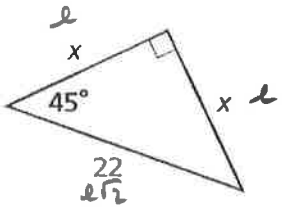
1.



$P = 16 + 8\sqrt{2}$

$A = \frac{1}{2}(8)(8) = 32 \text{ units}^2$

2.



$\ell\sqrt{2} = 22$

$\ell = \frac{22}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{22\sqrt{2}}{2}$

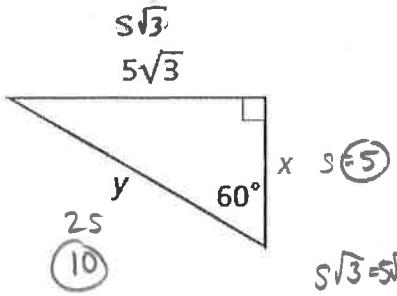
$\ell = 11\sqrt{2}$

$P = 11\sqrt{2} + 11\sqrt{2} + 22$

$P = 22\sqrt{2} + 22$

$A = \frac{1}{2}(11\sqrt{2})(11\sqrt{2}) = \frac{1}{2}(121)(2) = 121 \text{ units}^2$

3.



$5\sqrt{3}$

$S = 5$

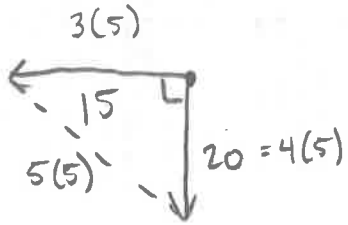
$5\sqrt{3} = 5\sqrt{3}$

$S = 5$

$P = 15 + 5\sqrt{3}$

$A = \frac{1}{2}(5\sqrt{3})(5) = \frac{25\sqrt{3}}{2} \text{ units}^2$

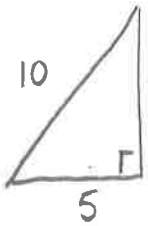
4. You and a friend start at the same point. You walk west 15 miles and your friend walks south 20 miles. How far apart are you?



25 miles apart

(use pythagorean thm or 3-4-5 pythagorean triplet)

5. A 10-foot ladder is leaned up against a wall. The base of the ladder is 5 feet away from the wall. How high up on the wall is the ladder?



$5^2 + b^2 = 10^2$

$25 + b^2 = 100$

$b^2 = 75$

$b = \sqrt{75}$

$\sqrt{75}$

$\sqrt{25}\sqrt{3}$

$5\sqrt{3}$

$b = 5\sqrt{3}$ or 8.7 ft

6. A nearby college is installing a walkway through the middle of a patch of grass so that students will not have to walk so far to get to class. How much farther (to the nearest foot) is it for students to walk around from point A to point B than it is to walk on the new walkway?

$50^2 + 80^2 = c^2$

$8900 = c^2$

$94.3 = c$

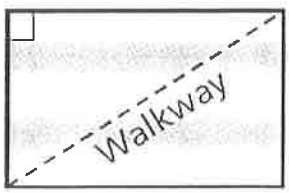
$50 + 80 = 130$

$130 - 94.3 = 35.7 \approx 36$

It is about 36 feet further to walk all the way around

80 ft

50 ft



Geometry CH 8-9 Review Name:_____ Blk____ Date:

7. Given the triangle with vertices $A(2,0), B(2,-5), C(1,-5)$, find all side lengths and angle measures.

AB = 5

BC = 1

AC = 5.1

mLA = 11.3°

mLB = 90°

mLC = 78.7°

$5^2 + 1^2 = c^2$

$26 = c^2$

$5.1 = c$

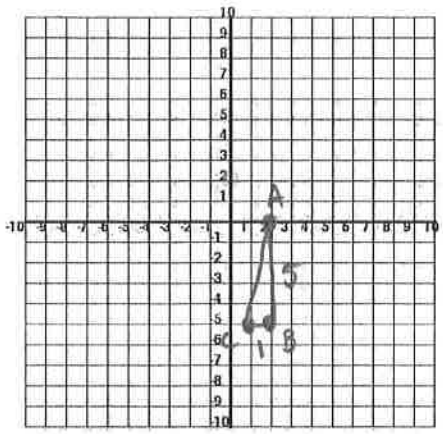
$\tan A = \frac{1}{5}$

$m\angle A = \tan^{-1}\left(\frac{1}{5}\right)$

$m\angle A = 11.3^\circ$

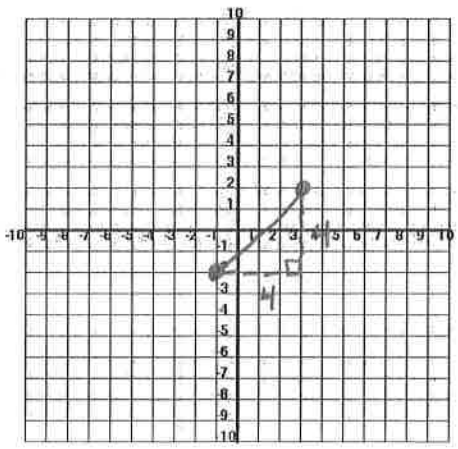
$m\angle B = 90 - 11.3$

$m\angle B = 78.7^\circ$



8. You and a friend just bought walkie-talkies with 6-mile range. If you are standing at the point (3, 2) and your friend is at the point (-1, -2), will you be able to hear each other? Show work to defend your answer.

Distance between people would be $4\sqrt{2}$ or 5.7.
So, yes, you would be able to hear each other

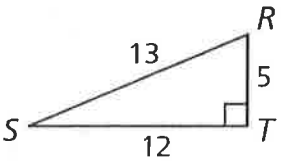


Determine which of the two acute angles has the given trigonometric ratio.

9. $\tan\theta = \frac{5}{12}$

10. $\cos\theta = \frac{12}{13}$

11. $\sin\theta = \frac{5}{13}$



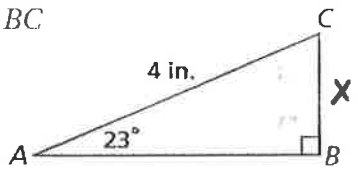
$\tan S = \frac{5}{12}$

$\cos S = \frac{12}{13}$

$\sin S = \frac{5}{13}$

Geometry CH 8-9 Review Name:_____ Blk____ Date:

12. Find the length of BC.

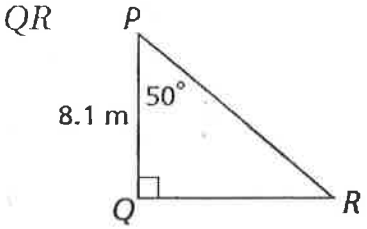


$\frac{\sin 23}{1} = \frac{X}{4}$

$X = 4 \sin 23$

$X = 1.6$

13. Find the length of QR.

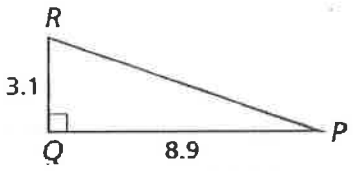


$\frac{\tan 50}{1} = \frac{X}{8.1}$

$X = 8.1 \tan 50$

$X = 9.7$

14. Find the measure of angle R and angle P.



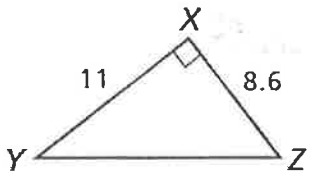
$\tan R = \frac{8.9}{3.1}$

$m\angle R = \tan^{-1}\left(\frac{8.9}{3.1}\right)$

$m\angle R = 70.8°$

$m\angle P = 90 - 70.8 = 19.2°$

15. Find the measure of angle Y and angle Z.



$\tan Y = \frac{8.6}{11}$

$m\angle Y = \tan^{-1}\left(\frac{8.6}{11}\right)$

$m\angle Y = 38.0°$

$m\angle Z = 90 - 38 = 52°$

16. Joe is trying to find the height of a flagpole. The distance from the ground to his eyes is 6 feet and the distance from Joe to the flagpole is 10 feet. The angle formed from his horizontal line of sight to the top of the flagpole is 56.31°. Find the height of the flagpole.

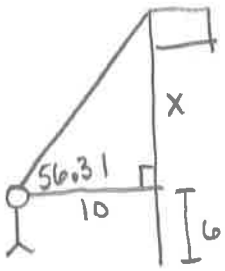
$\frac{\tan 56.31}{1} = \frac{X}{10}$

$X = 10 \cdot \tan 56.31$

$X = 15$ feet

15 feet + 6 feet

21 feet



17. A telephone pole is supported by steel cables as shown in the figure. If the phone company were planning on installing another cable on the other side 17 feet from the pole, how much total steel cable is used for **both** of the steel cables combined?

$\frac{\cos 65}{1} = \frac{17}{X}$

$X = \frac{17}{\cos 65}$

$X = 40.2$ ft

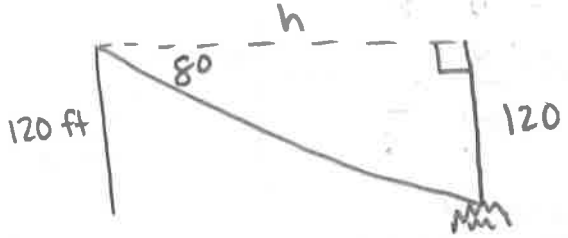
For two cables:

$40.2(2) =$ 80.4 ft

17 ft

Geometry CH 8-9 Review Name:_____ Blk____ Date:

18. A forest ranger in a 120 foot observation tower sees a fire. The angle of depression to the fire is 8°. What is the horizontal distance between the tower and the fire? Round to the nearest foot.

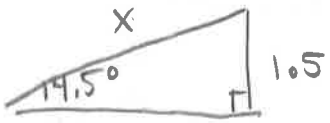


$\frac{\tan 8}{1} = \frac{120}{h}$

$h = \frac{120}{\tan 8}$

$h = 853.8$ ft

19. A ramp is leaned on a porch that is 1.5 feet off the ground. If the angle a ramp makes with the ground is 14.5°, find the length of the ramp.

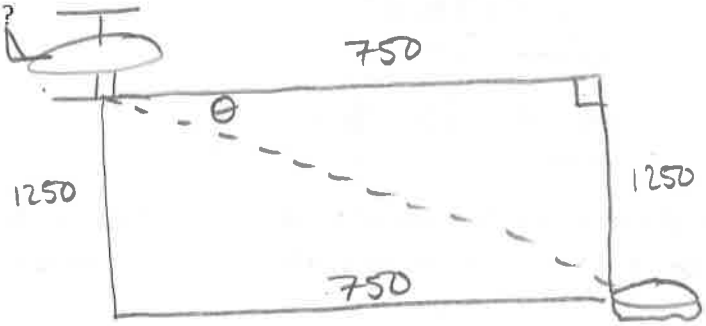


$\frac{\sin 14.5}{1} = \frac{1.5}{X}$

$X = \frac{1.5}{\sin 14.5}$

$X = 6.0$ feet

20. The pilot of a rescue helicopter is flying over the ocean at an altitude of 1250 feet. The pilot sees a life raft about 750 feet away (Horizontal distance). What is the angle of depression from the helicopter to the life raft to the nearest degree?

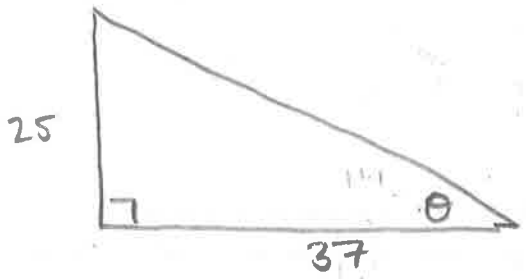


$\tan\theta = \frac{1250}{750}$

$\theta = \tan^{-1}\left(\frac{1250}{750}\right)$

$\theta = 59°$

21. A 25 foot tall light pole casts a shadow on the ground that is 37 feet long. What is the angle of elevation from the end of the shadow to the top of the light pole?

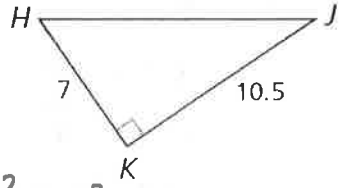


$\tan\theta = \frac{25}{37}$

$\theta = \tan^{-1}\left(\frac{25}{37}\right)$

$\theta = 34.0°$

22. Using triangle HJK, find all of the missing side lengths and angles.



$\tan H = \frac{10.5}{7}$

$m\angle H = \tan^{-1}\left(\frac{10.5}{7}\right)$

$m\angle H = 56.3°$

$m\angle J = 90 - 56.3$

$m\angle J = 33.7°$

$7^2 + 10.5^2 = c^2$

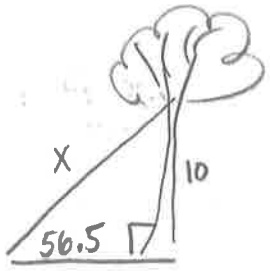
$\sqrt{159.25} = \sqrt{c^2}$

$12.6 = c$

$HJ = 12.6$

Geometry CH 8-9 Review Name:_____ Blk____ Date:

23. When a new tree is planted, rope is tied to it and then staked to the ground to hold it upright. If 3 pieces of rope is tied to the tree 10 feet off the ground and the rope forms a 56.5° angle with the ground, how much rope would you need?



$\sin 56.5 = \frac{10}{X}$

$X = \frac{10}{\sin 56.5}$

$X = 12.0$

3 pieces of rope

12.0 (3)

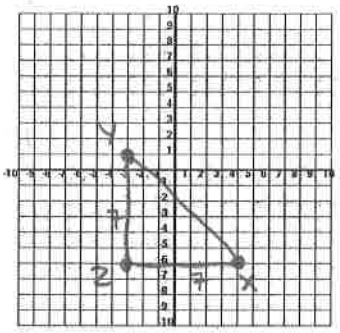
36 feet

24. For a triangle with vertices $X(4,-6), Y(-3,1), Z(-3,-6)$, find all side lengths and angle measures.

$m\angle X = 45$ $YZ = 7$

$m\angle Y = 45$ $XZ = 7$

$m\angle Z = 90$ $XY = 7\sqrt{2}$

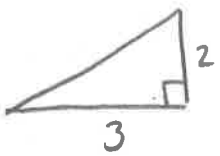


25. Point K is exactly 13 units from the origin (0,0). Which of the following are the possible coordinates for point K?

(5-12-13 triplet)

A. (8, 15) B. (13, 13) C. (7, 6) D. (5, 12)

26. In order to get to school each day, Michelle walks 3 miles east on Panther Drive, and then turns and walks 2 miles north on school road. How much farther is it for Michelle to walk along these two roads instead of walking in a straight line directly from school to her home?



$2^2 + 3^2 = c^2$

$4 + 9 = c^2$

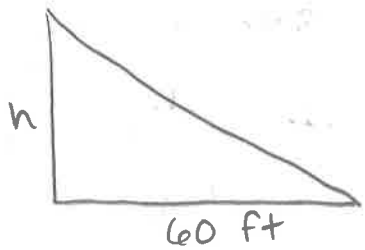
$\sqrt{13} = \sqrt{c^2}$

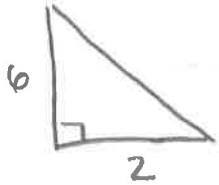
$3.6 = c$

5 - 3.6

1.4 more miles to walk the roads instead of taking direct route

27. A free-fall ride at an amusement park casts a shadow ft long. At the same time, a 6-foot-tall person standing in line casts a shadow 2 feet long. What is the height of the ride? Round your answer the nearest tenth of a foot.





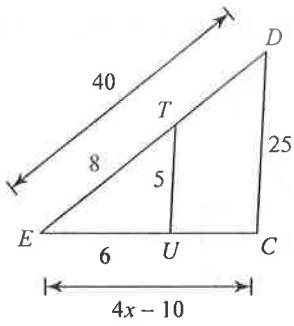
$\frac{h}{6} = \frac{60}{2}$

$2h = 360$

$h = 180$ ft

Solve for x. The triangles in each pair are similar.

28)



$\frac{6}{4x-10} = \frac{8}{40}$

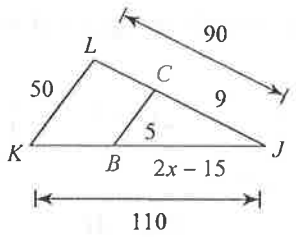
$\frac{3}{2x-5} = \frac{1}{5}$

$2x - 5 = 15$

$2x = 20$

$x = 10$

29)



$\frac{2x-15}{110} = \frac{9}{90}$

$\frac{2x-15}{110} = \frac{1}{10}$

$10(2x-15) = 110$

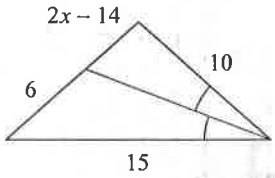
$20x - 150 = 110$

$20x = 260$

$x = 13$

Solve for x.

30)



$\frac{2x-14}{10} = \frac{6}{15}$

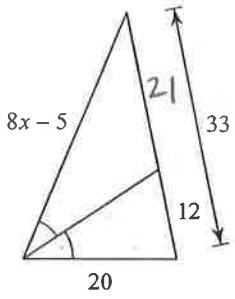
$\frac{x-7}{5} = \frac{2}{5}$

$5x - 35 = 10$

$5x = 45$

$x = 9$

31)



$\frac{21}{8x-5} = \frac{12}{20} = \frac{3}{5}$

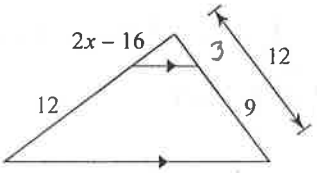
$3(8x-5) = 105$

$8x - 5 = 35$

$8x = 40$

$x = 5$

32)



$\frac{2x-16}{12} = \frac{3}{9} = \frac{1}{3}$

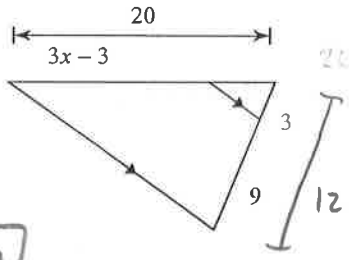
$3(2x-16) = 12$

$2x - 16 = 4$

$2x = 20$

$x = 10$

33)



$\frac{20}{3x-3} = \frac{12}{9}$

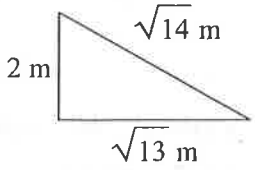
$36x - 36 = 180$

$36x = 216$

$x = 6$

State if each triangle is acute, obtuse, or right.

34)



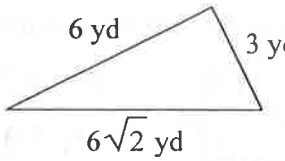
$c^2 ? a^2 + b^2$

$(\sqrt{14})^2 \quad (2)^2 + (\sqrt{13})^2$

$14 < 4 + 13$

ACUTE

35)



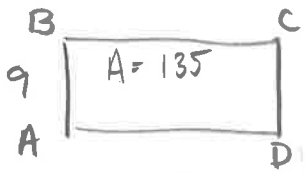
$c^2 ? a^2 + b^2$

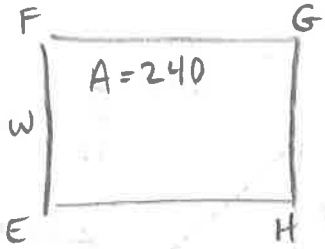
$(6\sqrt{2})^2 \quad 3^2 + 6^2$

$72 > 9 + 36$

OBTUSE

36) It is given that rectangle ABCD ~ EFGH. The area of rectangle ABCD is 135 in2 and the area of rectangle EFGH is 240 in2. If the width of rectangle ABCD is 9 in., what is the length and width of rectangle EFGH?





$\left(\frac{9}{w}\right)^2 = \frac{135}{240} \quad \div 15 \quad \div 15$

$\frac{81}{w^2} = \frac{9}{16}$

$9w^2 = 1296$

$w^2 = 144$

$w = 12$

$240 = (12)(\ell)$

$20 = \ell$

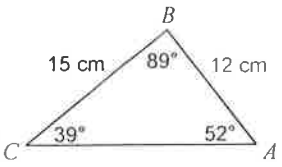
Advanced Geometry Name _____ ID: 1

Law of Sines/Law of Cosines/Area Review

Date _____ Period ____

Find each measurement indicated. Round your answers to the nearest tenth.

37) Find AB



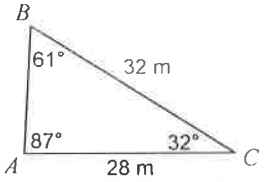
$\frac{\sin A}{a} = \frac{\sin C}{c}$

$\frac{\sin 52}{15} = \frac{\sin 39}{c}$

$c \sin 52 = 15 \sin 39$

$c = \frac{15 \sin 39}{\sin 52} = 12.0$ cm

38) Find BC



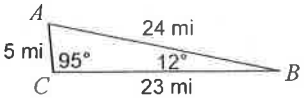
$\frac{b}{\sin B} = \frac{a}{\sin A}$

$\frac{28}{\sin 61} = \frac{a}{\sin 87}$

$\frac{28 \cdot \sin 87}{\sin 61} = a$

$32.0 \text{ m} = a$

39) Find $m\angle B$



$\frac{\sin B}{b} = \frac{\sin C}{c}$

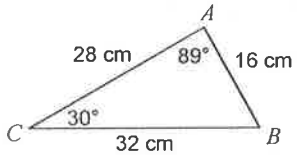
$\frac{\sin B}{5} = \frac{\sin 95}{24}$

$\sin B = \frac{5 \cdot \sin 95}{24}$

$m\angle B = \sin^{-1}(\text{ANS})$

$m\angle B = 12.0°$

40) Find $m\angle C$



$\frac{\sin C}{c} = \frac{\sin A}{a}$

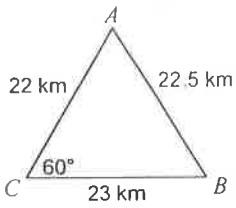
$\frac{\sin C}{16} = \frac{\sin 89}{32}$

$\sin C = \frac{16 \cdot \sin 89}{32}$

$m\angle C = \sin^{-1}(\text{ANS})$

$m\angle C = 30.0$

41) Find AB



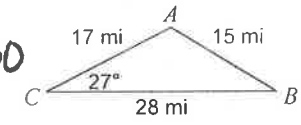
$c^2 = a^2 + b^2 - 2ab\cos C$

$c^2 = 22^2 + 23^2 - 2(22)(23)\cos 60$

$C = \sqrt{\text{ANS}}$

$C = 22.5$ km

42) Find AB



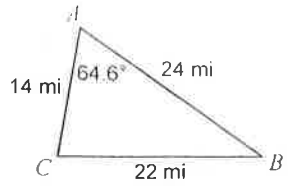
$c^2 = a^2 + b^2 - 2ab\cos C$

$c^2 = 17^2 + 28^2 - 2(17)(28)\cos 27$

$C = \sqrt{\text{ANS}}$

$C = 15.0$ mi

43) Find $m\angle A$



$a^2 = b^2 + c^2 - 2bc\cos A$

$22^2 = 14^2 + 24^2 - 2(14)(24)\cos A$

$484 = 772 - 672\cos A$

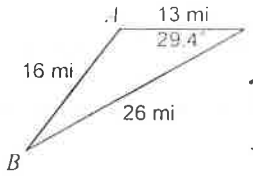
$-288 = -672\cos A$

$\frac{-288}{-672} = \cos A$

$m\angle A = \cos^{-1}(\text{ANS})$

$m\angle A = 64.6°$

44) Find $m\angle C$



$c^2 = a^2 + b^2 - 2ab\cos C$

$16^2 = 26^2 + 13^2 - 2(26)(13)\cos C$

$256 = 845 - 676\cos C$

$-589 = -676\cos C$

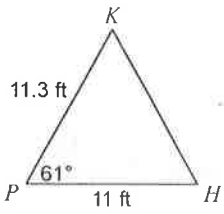
$\frac{-589}{-676} = \cos C$

$\cos^{-1}(\text{ANS}) = m\angle C$

$29.4° = m\angle C$

Find the area of each triangle to the nearest tenth.

45)



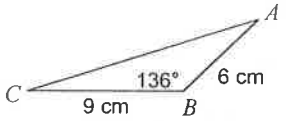
54.4 ft²

$A = \frac{1}{2}ab\sin C$

$= \frac{1}{2}(11.3)(11)(\sin 61)$

$= 54.4\ ft^2$

46)



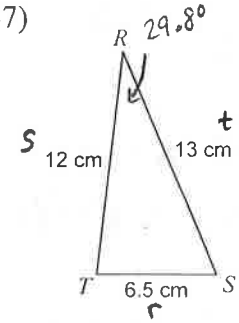
18.8 cm²

$A = \frac{1}{2}ac\sin B$

$= \frac{1}{2}(9)(6)\sin 136$

$= 18.8\ cm^2$

47)



38.8 cm²

First, find ANY angle using Law of cosines. Finding $m\angle R$:

$r^2 = s^2 + t^2 - 2(s)(t)\cos R$

$6.5^2 = 12^2 + 13^2 - 2(12)(13)\cos R$

$42.25 = 313 - 312\cos R$

$-270.75 = -312\cos R$

$\frac{-270.75}{-312} = \cos R$

$\cos^{-1}(\text{ANS}) = m\angle R$

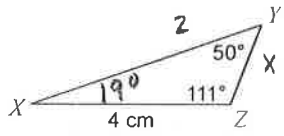
$29.80 = m\angle R$

$A = \frac{1}{2}(s)(t)\sin R$

$A = \frac{1}{2}(12)(13)\sin(29.8)$

$A = 38.8\ cm^2$

48)



3.2 cm²

$\frac{X}{\sin 19} = \frac{4}{\sin 50}$

$X = \frac{4\sin 19}{\sin 50}$

$X = 1.7$

$A = \frac{1}{2}(x)(y)\sin Z$

$= \frac{1}{2}(1.7)(4)\sin 111$

$A = 3.2\ cm^2$