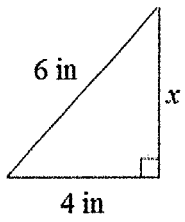
Name Key Unit 5 TEST REVIEW

Use Pythagorean theorem to solve for the missing side. Leave your answer in simplest radical form:

1.



$x^2+4^2=6^2$

$x^2+16=36$

$-16 \quad -16$

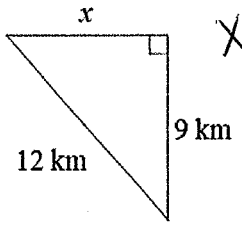
$x^2=20$

$x=\sqrt{4}\sqrt{5}$

$2\sqrt{5}$

x = $2\sqrt{5}$

2.



$x^2+9^2=12^2$

$x^2+81=144$

$-81 \quad -81$

$x^2=\sqrt{63}$

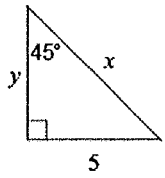
$x=\sqrt{9}\sqrt{7}$

$3\sqrt{7}$

x = $3\sqrt{7}$

Use special right triangles to solve for the missing sides:

3.

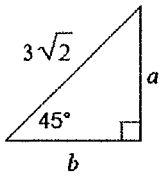


$\frac{5\sqrt{2}}{\sqrt{2}}$

x $5\sqrt{2}$

y 5

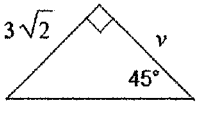
4.



a 3

b 3

5.



$3\sqrt{2}\cdot\sqrt{2}$

$3\sqrt{4}$

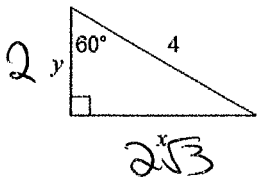
$3\cdot 2$

6

u 6

v $3\sqrt{2}$

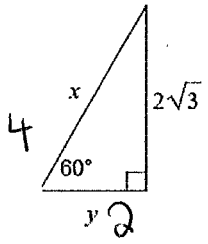
6.



x $2\sqrt{3}$

y 2

7.

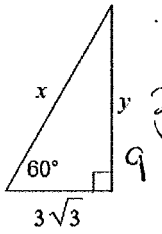


$\frac{2\sqrt{3}}{\sqrt{3}}$

x 4

y 2

8.



$3\sqrt{3}\cdot\sqrt{3}$

$3\sqrt{9}$

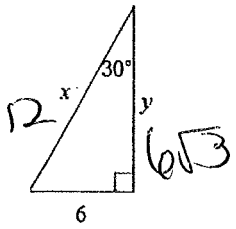
$3\cdot 3$

9

x $6\sqrt{3}$

y 9

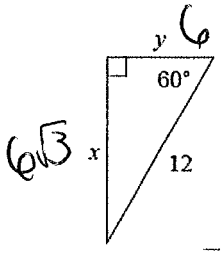
9.



x 12

y $6\sqrt{3}$

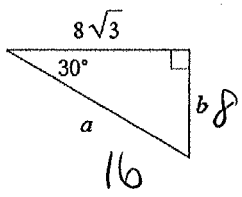
10.



x $6\sqrt{3}$

y 6

11.



$\frac{8\sqrt{3}}{\sqrt{3}} = 8$

a 16

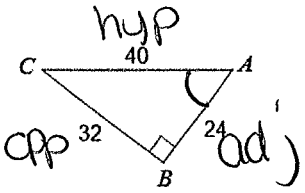
b 8

12. Write the **ratios**:

Sin A $32/40 = 4/5$

Cos A $24/40 = 3/5$

Tan A $32/24 = 4/3$

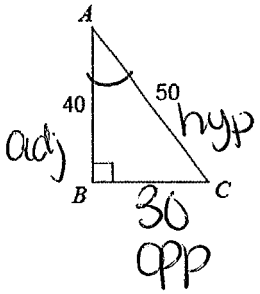


13. Write the **ratios**:

Sin A $\frac{30}{50} = \frac{3}{5}$

Cos A $\frac{40}{50} = \frac{4}{5}$

Tan A $\frac{30}{40} = \frac{3}{4}$



$x^2 + 40^2 = 50^2$

$x^2 + 1600 = 2500$

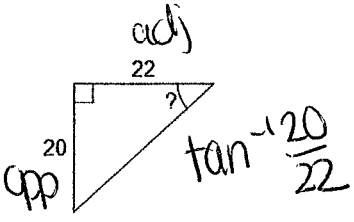
$-1600 \quad -1600$

$x^2 = 900$

$x = 30$

Solve for the missing angles:

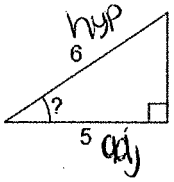
14.



$\tan^{-1}\frac{20}{22}$

42°

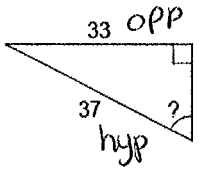
15.



$\cos^{-1}\frac{5}{6}$

34°

16.

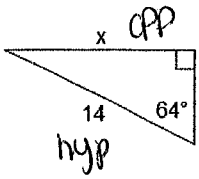


$\sin^{-1}\frac{33}{37}$

63°

Solve for the missing sides:

17.

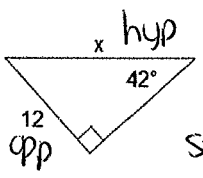


$\frac{\sin 64}{1} = \frac{x}{14}$

$x = 14 \cdot \sin 64$

12.6

18.

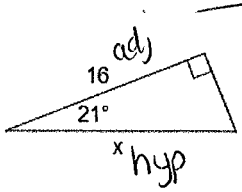


$\frac{\sin 42}{1} = \frac{12}{x}$

$\frac{12}{\sin 42} = \frac{x \cdot \sin 42}{\sin 42}$

17.9

19.

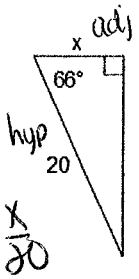


$\frac{\cos 21}{1} = \frac{16}{x}$

$\frac{16}{\cos 21} = \frac{x \cdot \cos 21}{\cos 21}$

17.1

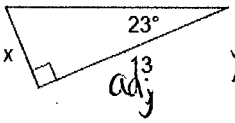
20.



$\frac{\cos 66}{1} = \frac{x}{20}$

$x = 20 \cdot \cos 66$ 8.1

21.

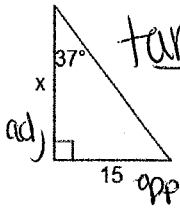


$\frac{\tan 23}{1} = \frac{x}{13}$

$x = 13 \cdot \tan 23$

5.5

22.



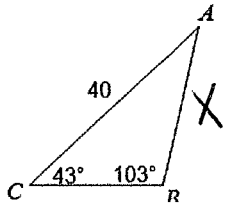
$\frac{\tan 37}{1} = \frac{15}{x}$

$\frac{15}{\tan 37} = \frac{x \cdot \tan 37}{\tan 37}$

19.9

Use the Law of Sines:

23. AB

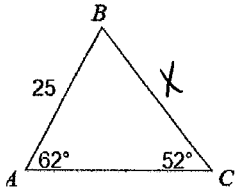


$\frac{x}{\sin 43} = \frac{40}{\sin 103}$

$\frac{40 \cdot \sin 43}{\sin 103} = \frac{x \cdot \sin 103}{\sin 103}$

28

24. BC



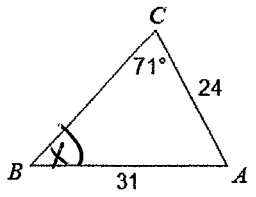
$\frac{x}{\sin 62} = \frac{25}{\sin 52}$

$\frac{25 \cdot \sin 62}{\sin 52} = \frac{x \cdot \sin 52}{\sin 52}$

28

Use the Law of Sines:

25. ∠B



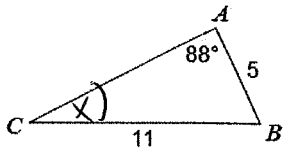
$\frac{24}{\sin X} = \frac{31}{\sin 71}$

$\frac{24 \cdot \sin 71}{31} = \frac{31 \cdot \sin X}{31}$

$\sin^{-1}(.732)$

47°

26. ∠C



$\frac{5}{\sin X} = \frac{11}{\sin 88}$

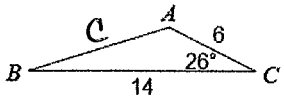
$\frac{5 \cdot \sin 88}{11} = \frac{11 \cdot \sin X}{11}$

$\sin^{-1}(.454268)$

27°

Use the Law of Cosines:

27. AB



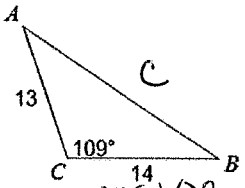
$C^2 = 6^2 + 14^2 - 2 \cdot 6 \cdot 14 \cdot \cos 26$

$C^2 = 81$

$C = 9$

9

28. AB



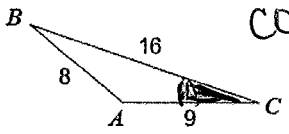
$C^2 = 13^2 + 14^2 - 2 \cdot 13 \cdot 14 \cdot \cos 109$

$C^2 = 483.5068$

$C = 21.9887$

22

29. ∠C



$\cos C = \frac{16^2 + 9^2 - 8^2}{2 \cdot 16 \cdot 9}$

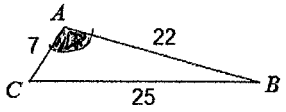
$= \frac{273}{288}$

$\cos^{-1}\left(\frac{273}{288}\right)$

$= 18.57$

19°

30. ∠A



$\frac{7^2 + 22^2 - 25^2}{2 \cdot 7 \cdot 22} = \frac{-92}{308}$

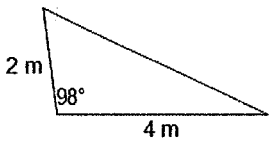
$\cos^{-1}\left(\frac{-92}{308}\right)$

$= 107.3796$

107°

Use the trig formula for area of a triangle to find the area:

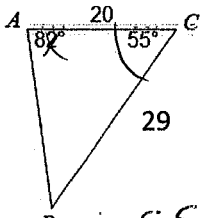
31.



$\frac{1}{2} \cdot 2 \cdot 4 \cdot \sin 98$

$3.96 = 4.0\ m^2$

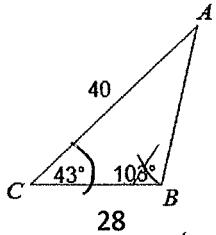
32.



$\frac{1}{2} \cdot 20 \cdot 29 \cdot \sin 55$

$237.6\ units^2$

33.

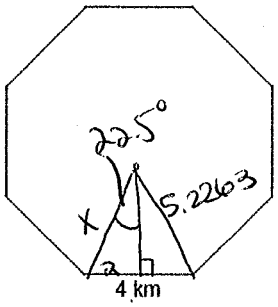


$\frac{1}{2} \cdot 40 \cdot 28 \cdot \sin 43$

$381.9\ units^2$

Find the area of the regular polygons:

34. $\frac{360}{8} = 45° \div 2 = 22.5$



$\frac{\sin 22.5}{1} = \frac{2}{X}$

$\frac{2}{\sin 22.5} = \frac{X \cdot \sin 22.5}{\sin 22.5}$

$X = 5.2263$

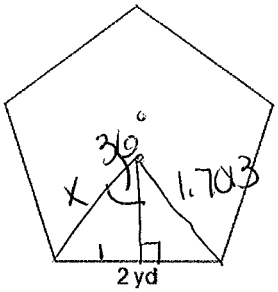
$77.3\ km^2$ $\frac{1}{2}(5.2263)(5.2263)(\sin 45)(8)$

35. $\frac{360}{5} = 72 \div 2 = 36$

$\frac{\sin 36}{1} = \frac{1}{X}$

$\frac{1}{\sin 36} = \frac{X \cdot \sin 36}{\sin 36}$

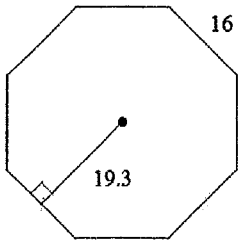
$1.7013 = X$



$6.9\ yd^2$ $\frac{1}{2}(1.7013)(1.7013)(\sin 72)(5)$

36.

$P = 16 \cdot 8 = 128$



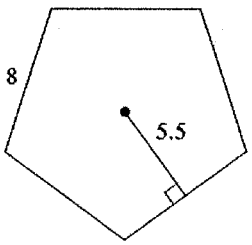
$\frac{1}{2}(19.3)(128)$

$1235.2\ units^2$

37.

$P = 5 \cdot 8 = 40$

$\frac{1}{2}(5.5)(40)$



$110\ units^2$

The sin of an angle = the cos of its complement

Write an equivalent trig expression for each problem:

38. B cos 48

A. cos 42

B. sin 42

C. sin 48

39. A sin 24

A. cos 66

B. sin 66

C. cos 24

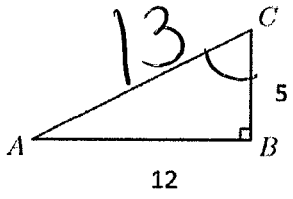
40. Sin 31 = cos 59°

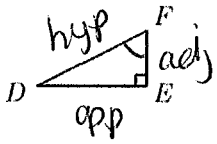
41. $\Delta ABC \sim \Delta DEF$

tan F 12/5

sin F 12/13

cos F 5/13





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

$169 = x^2$

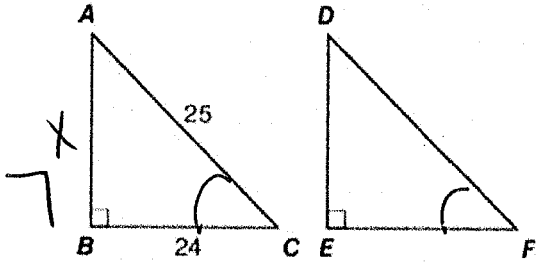
$13 = x$

42. $\Delta ABC \sim \Delta DEF$

cos B = $\frac{3}{5}$ cos E = 3/5

43. C

The diagram below shows two right triangles with the side measurements indicated. If $\Delta ABC \sim \Delta DEF$, find $\tan(\angle F)$.



A. $\frac{24}{25}$

B. $\frac{25}{24}$

C. $\frac{7}{24}$

D. not enough information

$x^2 + 24^2 = 25^2$

$x^2 = 49$

$x = 7$

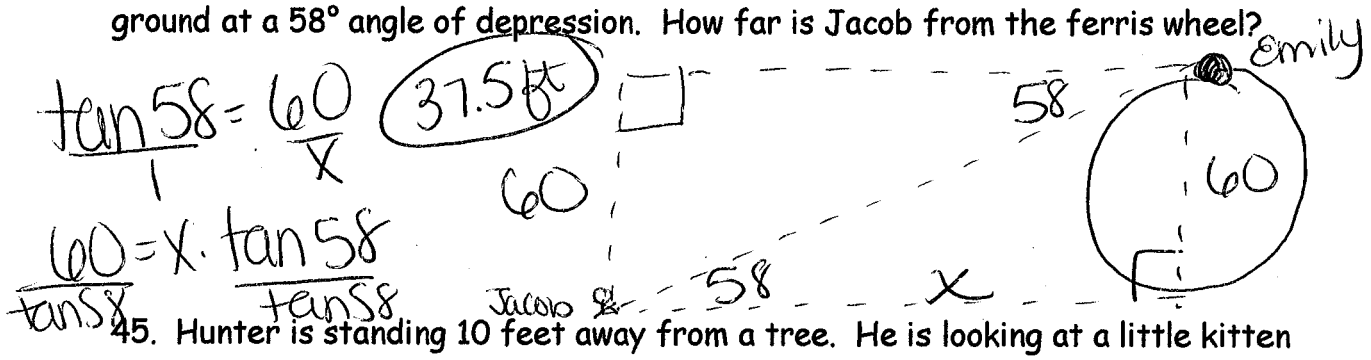
$\tan F = \tan C = \frac{7}{24}$

44. Emily is stuck at the top of a 60 foot ferris wheel. She sees Jacob on the ground at a 58° angle of depression. How far is Jacob from the ferris wheel?

$\frac{\tan 58}{1} = \frac{60}{x}$ 37.5 ft

$60 = x \cdot \tan 58$

$\frac{60}{\tan 58} = \frac{x \cdot \tan 58}{\tan 58}$

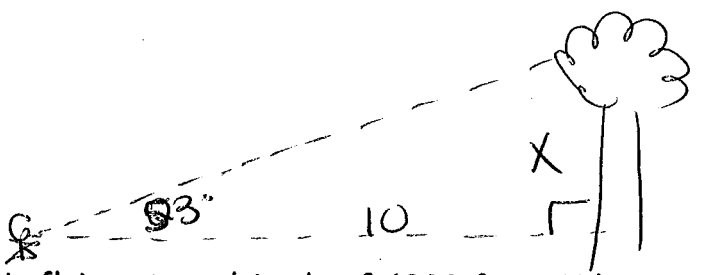


45. Hunter is standing 10 feet away from a tree. He is looking at a little kitten stuck in the tree at a 53° angle of elevation. How high up is the kitten in the tree?

$\tan 53 = \frac{x}{10}$

$x = 10 \cdot \tan 53$

$x = 13.3$ feet



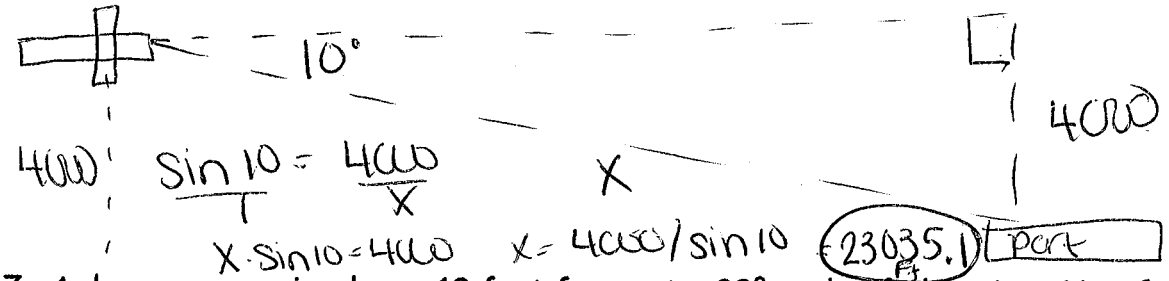
46. A plane is flying at an altitude of 4000 feet. When it begins its descent the pilot sees the airport at a 10° angle of depression. How far will the plane fly to reach the airport?

$\frac{\sin 10}{1} = \frac{4000}{x}$

$x \cdot \sin 10 = 4000$

$x = 4000 / \sin 10$

23035.1 ft



47. A dog sees a squirrel on a 10 foot fence at a 29° angle of elevation. How far is the dog from the fence?

$\frac{\tan 29}{1} = \frac{10}{x}$

$x = 18$ feet