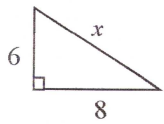


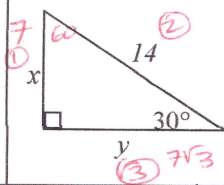
**NO CALCULATOR ALLOWED FOR THIS PORTION OF THE TEST**

1)  $x = 10$



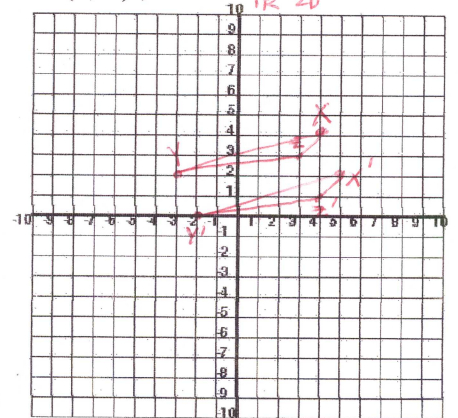
$6^2 + 8^2 = x^2$   
 $36 + 64 = x^2$   
 $100 = x^2$   
 $x = 10$

4)  $x = 7$      $y = 7\sqrt{3}$

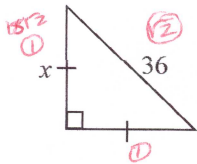


$\frac{14}{2} = 7$

6) Graph the image of the figure under the translation by the given vector.  $\triangle XYZ$  with vertices  $X(4, 4)$ ,  $Y(-3, 2)$ ,  $Z(3, 3)$ ;  $\vec{a} = \langle 1, -2 \rangle$

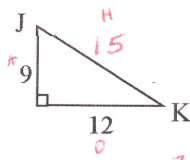


2)  $x = 18\sqrt{2}$



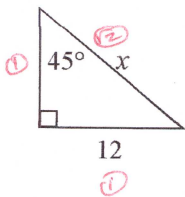
$\frac{36}{\sqrt{2}} = 18\sqrt{2}$

5) Refer to the diagram below. Leave answers as reduced fractions.



$\sin J = \frac{12}{15} = \frac{4}{5}$   
 $\cos K = \frac{12}{15} = \frac{4}{5}$   
 $\tan J = \frac{12}{9} = \frac{4}{3}$

3)  $x = 12\sqrt{2}$



$9^2 + 12^2 = x^2$   
 $81 + 144 = x^2$   
 $225 = x^2$   
 $x = 15$

Notes about the problems

- #1) You cannot use a trig ratio because we don't have one of the complementary angles involved.
- #2+3) These are 45-45-90 triangles; therefore the ratios are 1-1- $\sqrt{2}$ . In #2, they gave us something besides the "1"; that's why we divided. In #3, they gave us the "1", so we multiplied.
- #4) This is a 30-60-90 triangle, so the ratios are 1- $\sqrt{3}$ -2 in that order. They gave us the "2" (something besides the "1"), so we divided by the ratio. We got the "1", and we multiplied by the " $\sqrt{3}$ ".
- #5) In order to find the ratios, we need all three legs, so we had to use the Pythagorean Theorem to find it. Then we just referred to the angle requested (either L or K), and used SOH CAH TOA to write the fractions, + simplified.
- #6) Here, we start by plotting the points. Then, look at the vector. The "+1" tells us to go 1R, and the "-2" tells us to go 2 down, so every point gets applied that translation. Make sure to label every vertex, and add the "1" in the image (translated image).
- #7+8) These are right triangles with two sides and a complementary angle involved, so we use SOH CAH TOA.
- #9) This is not a right triangle, so we cannot use SOH CAH TOA. The only thing we can use is either the Law of Sines or the Law of Cosines. In this case, we use the Law of Sines as the measures involved are two angles and the sides opposite to them. The side across an angle has the same name as the angle, but in lowercase.
- #10) I first started using the Law of Cosines to find "c", but that is not necessary. You can use one of the sides as the base, and then draw the altitude that goes from the angle opposite that side + straight down. I chose then used sine to find the altitude (or the height). Plot the base and the altitude into  $A = \frac{1}{2}bh$ , and that gives you the area.
- #11) The angle of depression is congruent to the angle at the bottom of the triangle because they're alternate interior angles.
- #12) Use the distance formula to find the magnitude (or length), and tangent to find the direction (degrees).
- #13) Draw a picture of the situation. We have to use the Law of Cosines here.  $a^2 = b^2 + c^2 - 2bc \cos A$  (same letter at the ends)
- #14) Draw a picture + use tangent.
- #15) You can also say "Yes, because  $a^2 + b^2 = c^2$ . Also, by using the Law of Cosines, we can see that  $m\angle C = 90^\circ$ ". You have to show your work for both cases, though, even if you already know that it is a right triangle.

S = O  
H  
C = A  
H  
T = O  
A

Geometry CP

Name: Answer Key

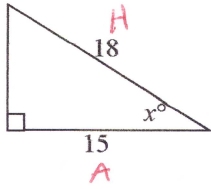
Date: \_\_\_\_\_

Period: \_\_\_\_\_

Chapter 8 practice test, Spring 2014 To receive full credit, show your work, and write your answer in the space provided.

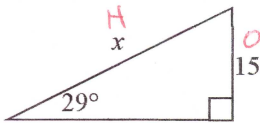
Round answers to the nearest tenth where needed.

7)  $x =$  33.6



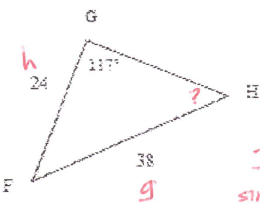
$\cos x = \frac{15}{18}$   
 $\cos^{-1}$   
 $x = 33.6$

8)  $x =$  30.9



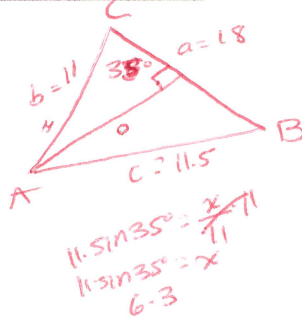
$\sin 29^\circ = \frac{15}{x}$   
 $x = \frac{15}{\sin 29^\circ}$   
 $x = 30.9$

9) Find the measure of  $\angle H$ : 34.2



$\frac{\sin G}{g} = \frac{\sin H}{h}$   
 $\frac{\sin 117^\circ}{24} = \frac{\sin H}{38}$   
 $24 \sin 117^\circ = 38 \sin H$   
 $\sin^{-1} \frac{38 \sin 117^\circ}{24}$   
 $m\angle H = 34.2$

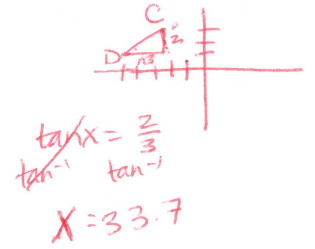
10) Draw a picture and label:  $m\angle C = 38^\circ$ ,  $a = 18$ ,  $b = 11$ .  
Find the area of  $\triangle ABC$ . 56.7



$c^2 = a^2 + b^2 - 2ab \cos C$   
 $c^2 = 18^2 + 11^2 - 2(18)(11) \cos 38^\circ$   
 $324 + 121 - 392.4$   
 $445 - 392.4$   
 $c = 11.5$   
 $A = \frac{1}{2}bh$   
 $A = \frac{1}{2}(11)(10.3)$   
 $56.7$

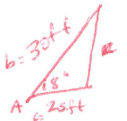
12) If the coordinates of  $\overline{CD}$  are C(-2,3) and D(-5, 1), find its magnitude 3.6 and its direction 33.7.

$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$   
 $d = \sqrt{(-2 - (-5))^2 + (3 - 1)^2}$   
 $\sqrt{3^2 + 2^2}$   
 $\sqrt{9 + 4}$   
 $\sqrt{13}$



13) Gail was visiting an art gallery. In one room, she stood so that she had a view of two statues. She was 30 feet from the first one, and 25 feet from the second one. The angle created by the lines of sight to the two statues was  $18^\circ$ . What is the distance between the two statues? 9.9ft

$a^2 = b^2 + c^2 - 2bc \cos A$   
 $a^2 = 30^2 + 25^2 - 2(30)(25) \cos 18^\circ$   
 $a^2 = 900 + 625 - 1426.6$   
 $a = 9.9$



14) A flag pole (standing straight up) casts a shadow on the ground that is 39 feet long. The sun is at an elevation angle of  $51^\circ$ . Find the height of the flag pole. 48.2

$\tan 51^\circ = \frac{x}{39}$   
 $x = 48.2$



15) Do the sides 48, 55 and 73 form a right triangle? Show your work and explain. Extra credit if you can explain it in two different ways.

We can show that these sides form a right triangle because  $48^2 + 55^2 = 73^2$  and, by using the Law of cosines we can see that  $m\angle C = 90^\circ$ .

$48^2 + 55^2 = 73^2$   
 $2304 + 3025 = 5329$   
 $5329 = 5329$

$c^2 = a^2 + b^2 - 2ab \cos C$   
 $73^2 = 48^2 + 55^2 - 2(48)(55) \cos C$   
 $5329 = 2304 + 3025 - 5280 \cos C$   
 $5329 = 5329 - 5280 \cos C$   
 $-5329 = -5280 \cos C$   
 $0 = -5280 \cos C$   
 $\frac{0}{-5280} = \frac{\cos C}{-5280}$   
 $0 = \cos C$   
 $\cos^{-1}$   
 $m\angle C = 90^\circ$

11) A ski run is 900 yards long with a vertical drop of 195 yards. Find the angle of depression from the top of the ski run to the bottom. 12.2

$\tan x = \frac{195}{900}$   
 $\tan^{-1}$   
 $x = 12.2$

