

Math 366

NEATLY PRINT NAME: \_\_\_\_\_

Exam 2

STUDENT ID: \_\_\_\_\_

Spring 2006

DATE: \_\_\_\_\_

Scarborough

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SECTION (circle one): 502<sub>MWF 1:50 pm</sub> 505<sub>MWF 3pm</sub>

"On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work."

\_\_\_\_\_  
Signature of student

Academic Integrity Task Force, 2004

<http://www.tamu.edu/aggiehonor/FinalTaskForceReport.pdf>

**WRITE ALL SOLUTIONS IN THE SPACE PROVIDED; FULL CREDIT WILL NOT BE GIVEN WITHOUT CORRECT ACCOMPANYING WORK. FULLY SIMPLIFY ALL ANSWERS AND GIVE EXACT ANSWERS UNLESS OTHERWISE STATED. WHERE PROVIDED, PUT YOUR FINAL ANSWER IN THE BLANK PROVIDED. POINTS WILL BE DEDUCTED FOR SPELLING ERRORS. REMEMBER YOUR UNITS!**

1. (11pts – 1pt each) True/False. Write ‘true’ or ‘false;’ do not abbreviate.

- \_\_\_\_\_ a. All rhombi are similar.
- \_\_\_\_\_ b. The angle bisectors of a scalene triangle meet at a point that is equidistant from the three vertices.
- \_\_\_\_\_ c. An altitude of a triangle is never on the exterior of a triangle.
- \_\_\_\_\_ d. Given any three line segments, one can always construct a triangle.
- \_\_\_\_\_ e. The  $\cos 45^\circ = \frac{\sqrt{2}}{2}$  whether the length of the hypotenuse is 8 or  $\sqrt{6}$ .
- \_\_\_\_\_ f. Any point on an angle bisector is equidistant from the sides of the angle.
- \_\_\_\_\_ g. No rectangle is a rhombus.
- \_\_\_\_\_ h. In a pair of right triangles, if two legs of one are congruent respectively to two legs of the other, then the triangles are congruent by SAS.
- \_\_\_\_\_ i. The diagonals of a kite bisect nonconsecutive angles.
- \_\_\_\_\_ j. Any pair of parallel lines have equal slopes.
- \_\_\_\_\_ k. Consecutive angles between parallel sides of a trapezoid are complementary.

\_\_\_\_\_ 2. (5pts) The lengths of two sides of a triangle are 8 and 20. If  $x$  is the length of the third side, use the Triangle Inequality to find the range of real-number values for  $x$ .

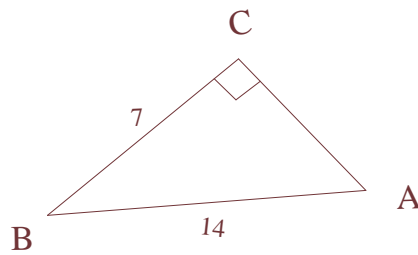
(12pts) 3. Exactly find the following.

\_\_\_\_\_ =  $\cos 60^\circ$

\_\_\_\_\_ =  $\sin 45^\circ$

\_\_\_\_\_ =  $\tan^{-1} \frac{\sqrt{3}}{3}$

\_\_\_\_\_ =  $\cos A$

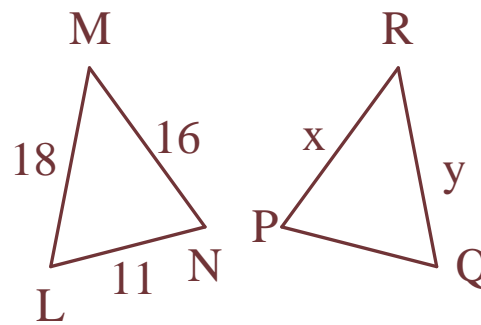


$y =$  \_\_\_\_\_ 4. (4pts) Find the equation of the line through points  $(3, -1)$  and  $(-4, r)$ .

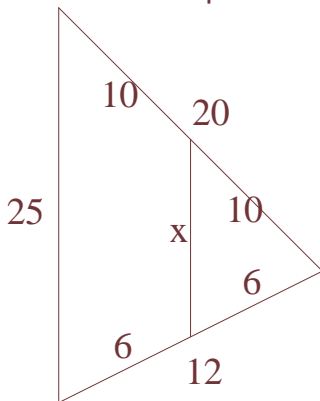
\_\_\_\_\_ 5. (3pts) A 122-cm person tall casts a 37 cm shadow at the same time a tree casts a 148 cm shadow. How tall is the tree?

\_\_\_\_\_ 6. (4pts) How many different one-to-one correspondences could be listed between vertices of two quadrilaterals?

x = \_\_\_\_\_ 7. (3pts) If  $\triangle LMN \cong \triangle QRP$ , what is the value of x?



x = \_\_\_\_\_ 8. (3pts) Find the value of x as a rational, fractional number in simplest form.



9. (4pts) For the following, are the given conditions sufficient to prove that  $\triangle UVW \cong \triangle XYZ$ ? Yes or no? Why or why not?

\_\_\_\_\_  $\overline{UV} \cong \overline{XY}$ ,  $\overline{UW} \cong \overline{XZ}$ ,  $\angle V \cong \angle Y$

\_\_\_\_\_  $\angle V \cong \angle Y$ ,  $\angle U \cong \angle X$ ,  $\overline{UV} \cong \overline{XY}$

(3pts) 10. Draw an example of similar figures that are not congruent.

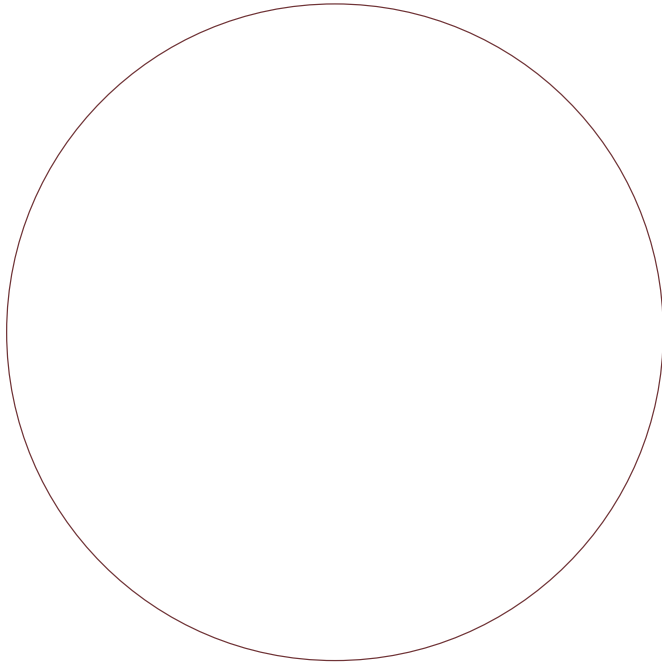
11. Solve each system of equations, if possible.

(4pts) a. 
$$\begin{aligned} 2x + 5y &= 20 \\ 3y + 6 &= x - 15 \end{aligned}$$

(4pts) b. 
$$\begin{aligned} 3x - 4y &= 7 \\ 6x - 8y &= 14 \end{aligned}$$

(4pts) 12. Describe a set of minimal conditions to determine if two regular polygons are congruent.

13. (6pts) By construction, find the center of the circle.



14. (9pts) Construct a parallelogram that has at least one 75-degree angle.

(10pts) 15. Prove that an altitude of an isosceles triangle bisects the opposite side. Sketch the appropriate figure.

1. Isosceles  $\triangle ABC$  with  
altitude  $\overline{BD}$

1. Given

2.

2. Definition of isosceles triangle

3.  $\overline{BD} \perp \overline{AC}$

3. Definition of altitude

4.

4. Definition of perpendicular

5.  $\angle BDA \cong \angle BDC$

5.

6.

6. The angles opposite the congruent sides of an isosceles triangle are congruent.

7.  $\triangle ADB \cong \triangle CDB$

7.

8.  $\overline{AD} \cong \overline{CD}$

8. (Give a complete sentence here!)

9.

9.

QED

(11pts) 16. Prove the diagonals of square MATH bisect each other. Please use the labels given.

