Name: Zayd Abu-Ghazaleh

Date:_____ Pd._____

Read all directions carefully.
Watch out for simple, careless errors.
Make sure all figures are labeled appropriately.
Please indicate all answers clearly so they are easy to locate.
Show ALL work you have done to receive full credit for your answer.

1) (5 pts.) Draw a rectangle using algebra tiles for the expression $2x^2 + 7x + 5$. Sketch your
rectangle and write the area as a sum and as a product. $2x^2 + 7x + 5$

small rectangle
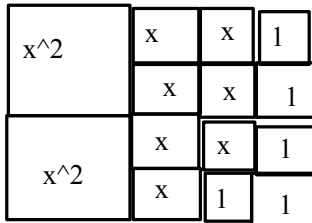
$2x^2 + 5x + 2x + 5$

$x(2x+5) + 2x + 5$

$(x+1)(2x+5)$

2) (3 pts.) **Multiple Choice:** The quadratic expression $6x^2 + 6x - 12$ has several possible sets of
factors. Which set of factors below is <u>not</u> a possible answer? Explain how you know.

a. $6(x-1)(x+2)$ b. $(6x-6)(x+2)$

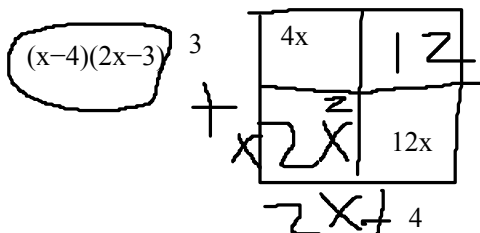c. $(x-6)(6x+2)$ d. $(3x-3)(2x+4)$

You can't have (x-6)(6x+2) as a factor because when you distribute 6x to x-6, it turns into 6x^2 +12x.
After this, you can't have -12 into the quadratic expression anymore making it impossible.

3) (8 pts) Factor the following quadratics if possible. If a quadratic cannot be factored, explain why
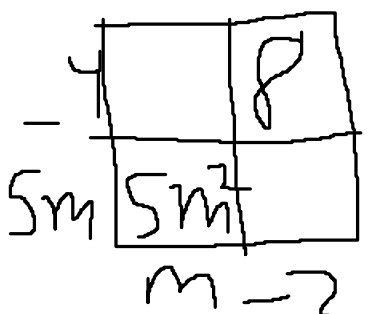not.

a. $2x^2 - 11x + 12$ b. $y^2 + 7y + 7$

This quadratic cannot be factored because there are no common factors.

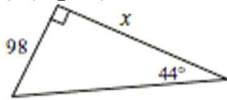(x−4)(2x−3)

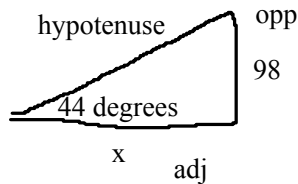c. $5m^2 - 14m + 8$ d. $\dfrac{15p^2 - 3p}{3}$

(5m-4)(m-2)   3(5p^2−1) * p

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4) (5 pts.) Solve for the missing side length. Show your work. Round lengths to the nearest tenth.
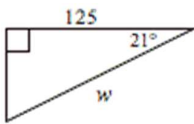
x

98

44°

101.5

hypotenuse

opp

98

44 degrees

x   adj
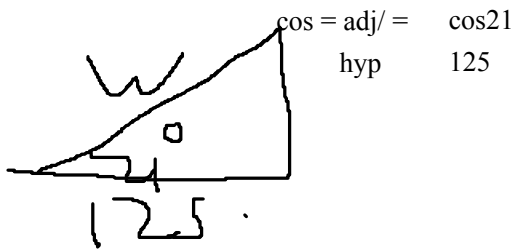
$\tan 44 \text{ degrees} = \frac{opp}{adj} = \frac{44}{x}$

$\frac{98}{\tan 44 \text{ degrees}}$

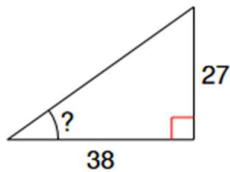5) (5 pts.) Use trigonometric ratios to solve for the variable. Show your work. Round lengths to the nearest tenth.
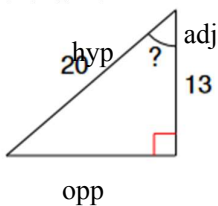
125

21°

w

133.9

$\cos = \frac{adj}{hyp} = \frac{\cos 21}{125}$

125

6) (3 pts.) Solve for the missing angle. Show your work.

27

?

38

$\tan(x) = opp/adj = 27/38$

35.37475184 or 35.4

7) (3 pts.) Solve for the missing angle. Show your work.

hyp   adj
20 ?
13

opp

$\cos(x) = adj/hyp. \; 13/20 = 0.65$

49.45839813 or 49.5

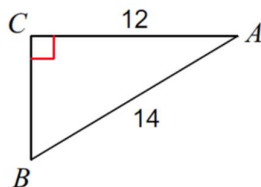8) (3 pts.) Solve for the missing angle. Show your work.

opp
12   adj

?

24
hyp
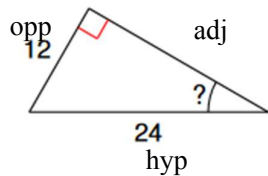
$\sin(x) = \text{opp/hyp}$

30

$12/24 = 0.5$ $\sin(0.5)$

9.) (6 pts.) Solve the triangle for all missing side lengths and angle measures. Show your work to receive full credit.

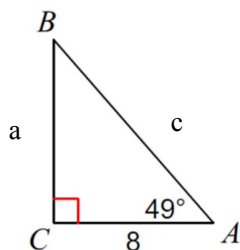C   12   A

14

B

$\cos(A) = 12/14$ plug into calculator

$\angle A =$ _31.00271914 or 31_

$\angle B =$ _58.99728086 or 59._

$a =$ _7.188 or 7.2_

$\sin(B)12/14$

$a^2 + b^2 = c^2$ so $14^2 - 12^2 = c^2$. This equals 7.188 rounded 7.2.

10) (6 pts) Solve the triangle for all missing side lengths and angle measures. Show your work to receive full credit.

B

a   c

49°

C   8   A

180 degrees in a triangle. 180 - 49 is 131-90=41

$\angle B =$ _42 degrees_ $\tan49 = x/8$

$a =$ _6.954293903 or 7_

$c =$ _12.19402469 or 12_

$\frac{x}{8} = \frac{1}{x}$

$\frac{8}{\tan 49}$

$\cos49 = 8/b$

$\frac{8}{1}x = \frac{8}{\cos 49}$

Bonus) (4 pts) Factor each of the expressions below, if possible. Show your work.

a. $169x^2 - 289$

(13x+17)(13x-17)

b. $x^2 + 10x + 25$

(x+5)(x+5)

c. $16x^2 - 8x + 1$

(4x-1)(4x-1)

d. $x^2 - \frac{1}{4}$

Not possible, no common factors.