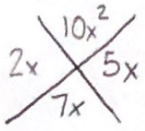
Ch.4 Factoring + Trig Test Version 3

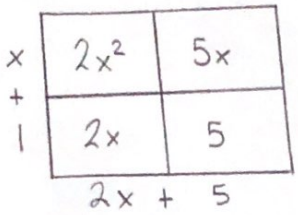
Name: Eunice Santos

Date: 12/6/20 Pd. 1

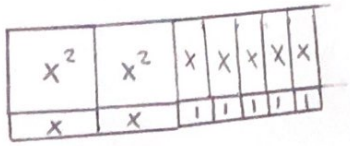
Read all directions carefully.
Watch out for simple, careless errors.
Make sure all figures are labeled appropriately.
Please indicate all answers clearly so they are easy to locate.
Show ALL work you have done to receive full credit for your answer.

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.





$(x+1)(2x+5) = 2x^2+7x+5$



2) (3 pts.) **Multiple Choice:** The quadratic expression $6x^2 + 6x - 12$ has several possible sets of factors. Which set of factors below is not a possible answer? Explain how you know. $ax^2+bx+c,\ a\neq 0$

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

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

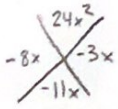
the factored form

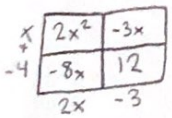
Set C is not a possible answer because it doesn't distribute correctly. The factored set doesn't result in the expression $6x^2+6x-12$.

$(x-6)(6x+2)$ $6x^2+2x-36x-12 \rightarrow 6x^2-34x-12 \neq 6x^2+6x-12$

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

a. $2x^2 - 11x + 12$





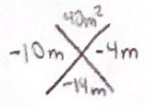
$(x-4)(2x-3)$

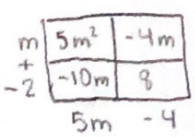
b. $y^2 + 7y + 7$

There are no two numbers that result as a product & sum of 7.

↑ As shown, the Diamond cannot be solved

c. $5m^2 - 14m + 8$

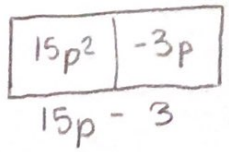




$(m-2)(5m-4)$

d. $15p^2 - 3p$

$p(15p-3)$



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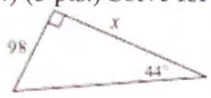
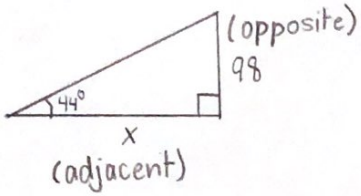
4) (5 pts.) Solve for the missing side length. Show your work. Round lengths to the nearest tenth.



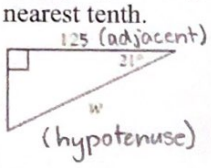


$x \cdot \tan(44) = \frac{98}{x} \cdot x$

$\frac{x(\tan 44)}{\tan(44)} = \frac{98}{\tan(44)}$

$x = 101.5$

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

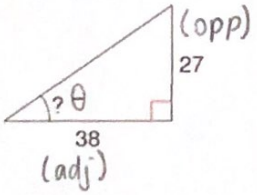


$w \cdot \cos(21) = \frac{125}{w} \cdot w$

$\frac{w(\cos 21)}{\cos(21)} = \frac{125}{\cos(21)}$

$w = 133.9$

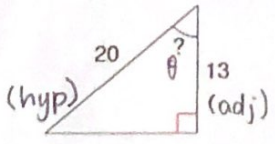
6) (3 pts.) Solve for the missing angle. Show your work.



$\tan^{-1}\left(\frac{27}{38}\right) = \theta$

$35.4^\circ = \theta$

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



$\cos^{-1}\left(\frac{13}{20}\right) = \theta$

$49.5^\circ = \theta$

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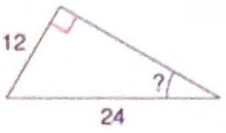
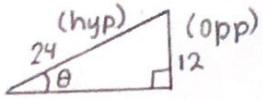
8) (3 pts.) Solve for the missing angle. Show your work.

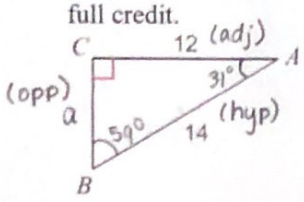


$\sin^{-1}\left(\frac{12}{24}\right) = \theta$

$30° = \theta$



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



$\cos^{-1}\left(\frac{12}{14}\right) = \angle A$

$31° = \angle A$

$180 - 90 - 31 = \angle B$ (Triangle Angle Sum Theorem)

$59° = \angle B$

$14 \cdot \sin(31) = \frac{a}{14} \cdot 14$

$14(\sin 31) = a$

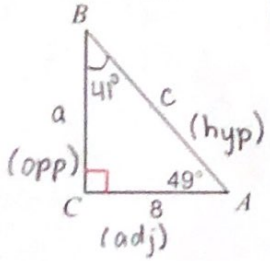
$7.2 = a$

$\angle A = 31°$

$\angle B = 59°$

$a = 7.2$

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



$180 - 90 - 49 = \angle B$ (Triangle Angle Sum Theorem)

$41° = \angle B$

$c \cdot \cos(49) = \frac{8}{c} \cdot c$

$\frac{c(\cos 49)}{\cos(49)} = \frac{8}{\cos(49)}$

$c = 12.2$

$8 \cdot \tan(49) = \frac{a}{8} \cdot 8$

$8(\tan 49) = a$

$9.2 = a$

$\angle B = 41°$

$a = 9.2$

$c = 12.2$

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

a. $169x^2 - 289$

Difference of two squares

$\sqrt{169} = 13 \quad \sqrt{289} = 17$

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

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

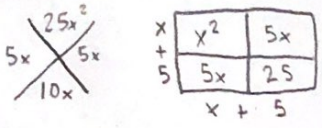
$4x$	$16x^2$	$-4x$
-1	$-4x$	1
	$4x$	-1

$(4x-1)(4x-1) = (4x-1)^2$

Perfect Square Trinomial

$u^2 - 2uv + v^2 = (u-v)^2$

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



x	x^2	$5x$
$+5$	$5x$	25
	x	$+5$

$(x+5)(x+5) = (x+5)^2$

Perfect Square Trinomial

$u^2 + 2uv + v^2 = (u+v)^2$

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

$(x + \frac{1}{2})(x - \frac{1}{2})$

Difference of two squares

$(a+b)(a-b)$