Questions on 6.8 HW?

For each right triangle below find the missing side *n* (Pythagorean Theorem could be helpful) and the missing angle, a (Angle Sum Theorem for Triangles could be useful).

1.

$n^2 + 3^2 = 5^2$
$n^2 + 9 = 25$
$-9 \quad -9$
$\sqrt{n^2} \sqrt{16}$
$n = 4$

$4 = n$

a
5
53.18°
3

$90 - 53.18 = 36.82° = a$

2.

4
a
n
8
30°

3.

6
a
n
6
45°

4.

a
7
n
10
34.99°

5.

a
5
n
68.2°
2

6.

67.38°
13
5
a
n

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For each right triangle and the identified angle of reference create the desired trigonometric ratios. If any sides of the triangle are missing, find them before determining the ratio.

7.

adj.
OPP
7
*
B
hyp
hyp
8.06
C
OPP adj
4
A *
C

*A as ref. ∠
a. $\cos(A) = \dfrac{4}{8.06}$
b. $\sin(A) = \dfrac{7}{8.06}$
c. $\tan(A) = \dfrac{7}{4}$

*B as ref ∠
d. $\cos(B) = \dfrac{7}{8.06}$
e. $\sin(B) = \dfrac{4}{8.06}$
f. $\tan(B) = \dfrac{4}{7}$

8.

B
3
9.01
C
8.5
A

a. $\cos(A) =$
b. $\sin(A) =$
c. $\tan(A) =$

d. $\cos(B) =$
e. $\sin(B) =$
f. $\tan(B) =$

9.
B

10.
A

8.50 x 11.00 in

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3

Write each of the quadratic functions in factored form and then determine both the x-intercepts as well as the y-intercept. $ax^2 + bx + c$ standard   factored $(x-d)(x-e)$

11. $f(x) = x^2 + 9x + 20$

$b=9 \quad c=20$

a. Factored form:

$(x+4)(x+5) = 0$

b. x-intercepts: $x = -4, -5$

$(-4,0) \& (-5,0)$

c. y-intercept: $20 = y$

$(0,20)$

12. $g(x) = x^2 + 2x - 15$

a. Factored form:

b. x-intercepts:

c. y-intercept:

13. $h(x) = x^2 - 49$

a. Factored form:

b. x-intercepts:

c. y-intercept:

14. $r(x) = x^2 - 13x + 30$

a. Factored form:

b. x-intercepts:

15. $f(x) = x^2 + 20x + 100$

a. Factored form:

b. x-intercepts:

16. $g(x) = x^2 - 8x - 48$

a. Factored form:

b. x-intercepts:

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4

6.9 Relationships with Meaning
A Solidify Understanding Task
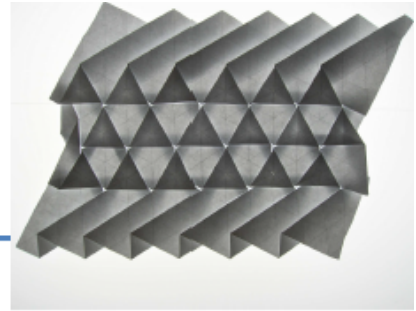
Part I

1. Use the information from the given triangle to write the following trigonometric ratios:

$\sin(A) = \dfrac{opposite}{hypotenuse} = \dfrac{6}{10} = \dfrac{3}{5}$

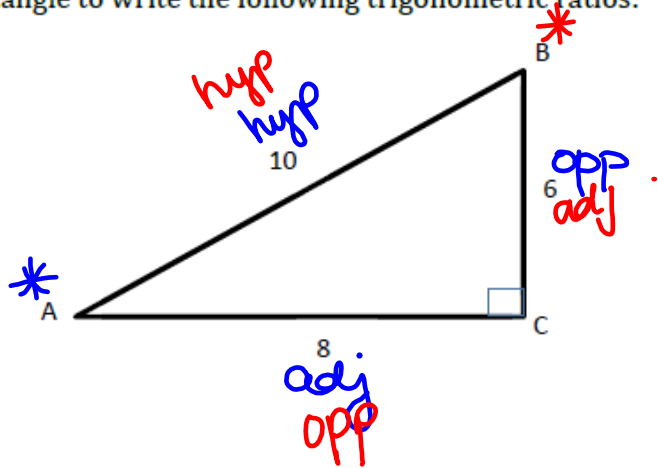$\cos(A) = \dfrac{adjacent}{hypotenuse} = \dfrac{8}{10} = \dfrac{4}{5}$

$\tan(A) = \dfrac{opposite}{adjacent} = \dfrac{6}{8} = \dfrac{3}{4}$

$\sin(B) = \dfrac{8}{10} = \dfrac{4}{5}$

$\cos(B) = \dfrac{6}{10} = \dfrac{3}{5}$

$\tan(B) = \dfrac{8}{6} = \dfrac{4}{3}$

2. Do the same for this triangle:
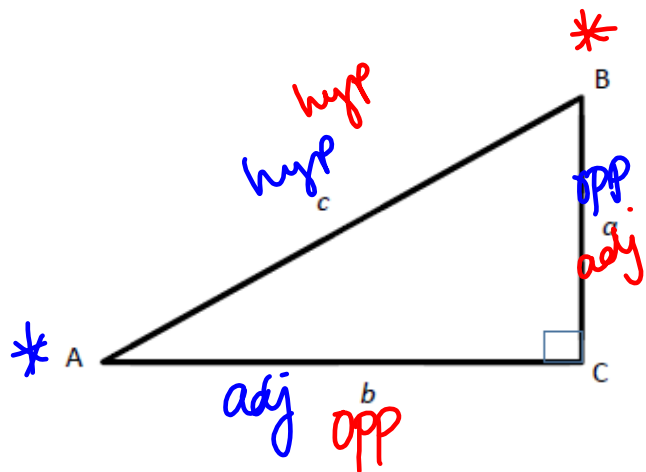
$\sin(A) = \dfrac{a}{c}$ *

$\cos(A) = \dfrac{b}{c}$ *

$\tan(A) = \dfrac{a}{b}$

$\sin(B) = \dfrac{b}{c}$

$\cos(B) = \dfrac{a}{c}$ *

$\tan(B) = \dfrac{b}{a}$

3. Use the information above to write observations you notice about the relationships of trigonometric ratios.   tan A & tan B are reciprocals

Sin A = cos B
cos A = sin B

4. Do you think these observations will always hold true? Why or why not?   yes

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Part 2

The following is a list of conjectures made by students about right triangles and trigonometric relationships. For each, state whether you think the conjecture is true or false. Justify your answer.

5. $\cos(A) = \sin(A)$ ~~False~~ False
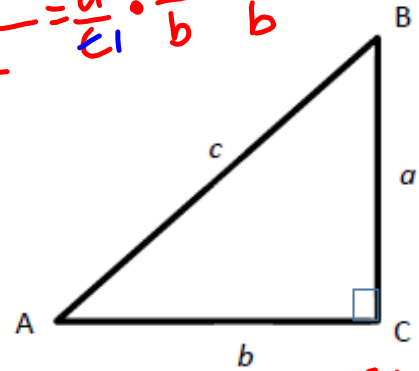 $b/c \neq a/c$

6. $\tan(A) = \dfrac{\sin(A)}{\cos(A)}$ True

7. $\sin(A) = \cos(90° - A)$ True   *(B)*
     $a/c = a/c$

8. $\cos(A) = \sin(B)$ True

9. $\cos(B) = \sin(90° - A)$ False   *(B)*
     $a/c \neq b/c$

10. $\tan(A) = \dfrac{1}{\tan(B)}$ True

(Handwritten, right side:)
$\dfrac{\sin A}{\cos A} = \dfrac{\frac{a}{c}}{\frac{b}{c}} = \dfrac{a}{c} \cdot \dfrac{c}{b} = \dfrac{a}{b}$

$\angle A + \angle B + 90 = 180$
$\angle A + \angle B = 90$
$\angle B = 90 - \angle A$

Note the following convention used to write: $[\sin(A)]^2 = \sin^2(A)]$

11. $\sin^2(A) + \cos^2(A) = 1$ True
      $\left(\dfrac{a}{c}\right)^2 + \left(\dfrac{b}{c}\right)^2 = 1 = \dfrac{a^2}{c^2} + \dfrac{b^2}{c^2} = \dfrac{a^2 + b^2}{c^2} = \dfrac{c^2}{c^2} = 1$

12. $1 - \sin(A)^2 = \cos^2(A)$ True

13. $\sin^2(A) = \sin(A^2)$ False

Part III

14. Given: A right triangle with the following trigonometric ratio: $\sin(30°) = \dfrac{1}{2}$, find all trigonometric ratios for this triangle. How do you know these values are always going to be true when given this angle?

Homework

Finish 6.9 "Ready, Set, Go"

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