Secondary Math II

Unit 5 Review

1. What does SOH-CAH-TOA stand for?

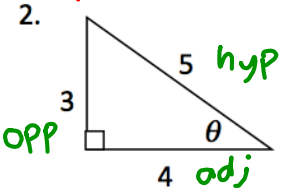
$\sin\theta = \frac{opp}{hyp}$

$\cos\theta = \frac{adj}{hyp}$

$\tan\theta = \frac{opp}{adj}$

Find all trigonometric functions for θ. $\sin\theta, \cos\theta, \tan\theta$

2.

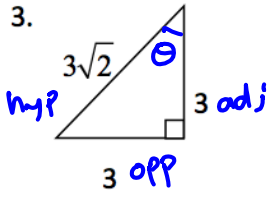


$\sin\theta = \frac{3}{5}$

$\cos\theta = \frac{4}{5}$

$\tan\theta = \frac{3}{4}$

3.



$\sin\theta = \frac{3}{3\sqrt{2}} = \frac{1}{\sqrt{2}}$

$\cos\theta = \frac{3}{3\sqrt{2}} = \frac{1}{\sqrt{2}}$

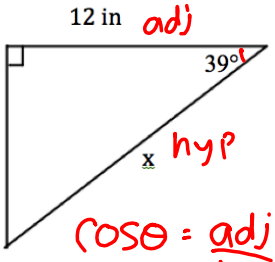
$\tan\theta = \frac{3}{3} = 1$

Evaluate using a calculator. Round to 3 decimal places. degree mode!

4. sin 42° 0.669
5. cos 82° 0.139
6. tan 29° 0.554
7. sin 7° 0.122

Set up and use trigonometric ratios to find the missing values.

8.



$\cos\theta = \frac{adj}{hyp}$

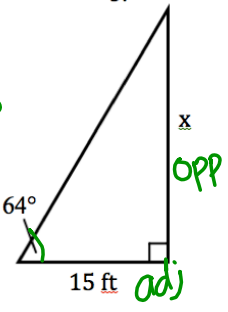
$\frac{\cos 39°}{1} = \frac{12}{x}$

$\frac{x \cdot \cos 39°}{\cos 39°} = \frac{12}{\cos 39°}$

$x = \frac{12}{\cos 39°}$ calc.

$x = 15.4$ in

9.



$\tan\theta = \frac{opp}{adj}$

$\frac{\tan 64°}{1} = \frac{x}{15}$

$15 \cdot \tan 64° = x$ calc.

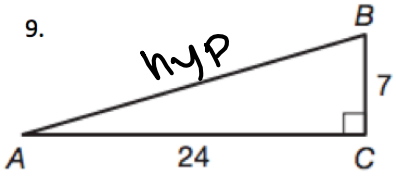
$x = 30.8$ ft

Find the missing side length.

$a^2+b^2=c^2$

legs hyp

9.



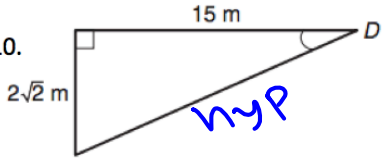
$7^2+24^2=c^2$

$49+576=c^2$

$\sqrt{625}=\sqrt{c^2}$

$25=c$

10.



$(2\sqrt{2})^2+15^2=c^2$

$2^2\cdot\sqrt{2}^2+15^2=c^2$

$4\cdot 2+225=c^2$

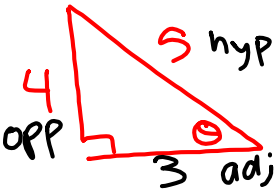
$8+225=c^2$

$\sqrt{233}=\sqrt{c^2}$

$15.3\approx c$

Draw a triangle and find all other trigonometric functions for problems.

11. $\sin\theta=\frac{4}{5}$ opp / hyp



$\cos\theta=\frac{3}{5}$

$\tan\theta=\frac{4}{3}$

$4^2+b^2=5^2$

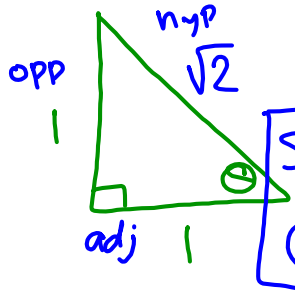
$16+b^2=25$

$-16 \quad -16$

$\sqrt{b^2}=\sqrt{9}$

$b=3$

12. $\tan\theta=1$ opp / adj



$\sin\theta=\frac{1}{\sqrt{2}}$

$\cos\theta=\frac{1}{\sqrt{2}}$

$1^2+1^2=c^2$

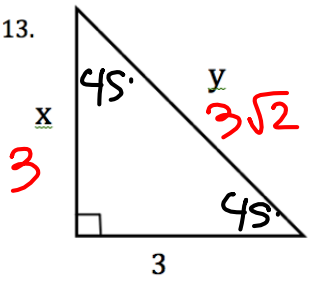
$1+1=c^2$

$\sqrt{2}=\sqrt{c^2}$

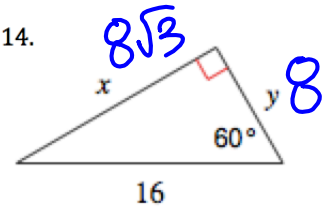
$\sqrt{2}=c$

Find the missing side lengths for each special triangle.

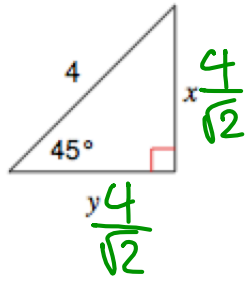
13.

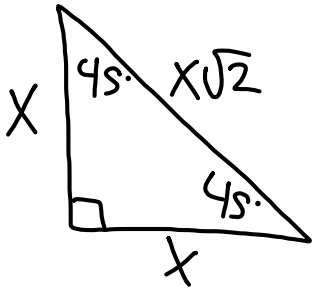


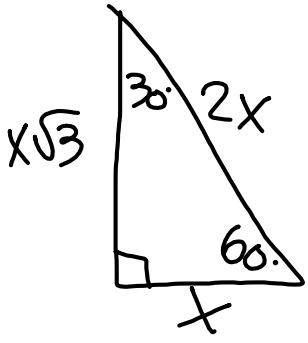
14.



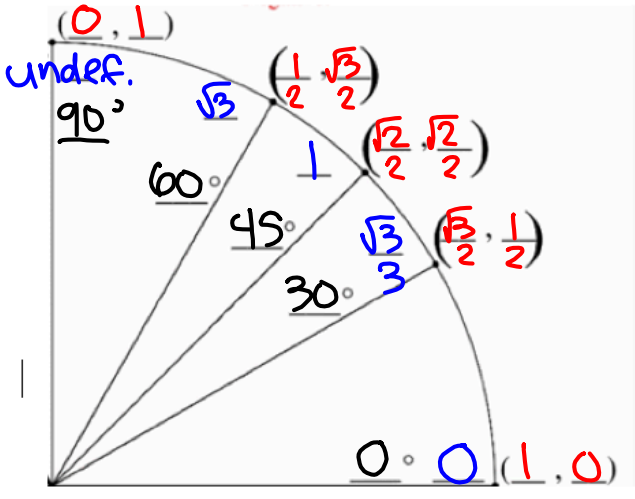
15.







16. Fill in the appropriate spaces in the unit circle.



(x, y)

* (cosθ, sinθ) *

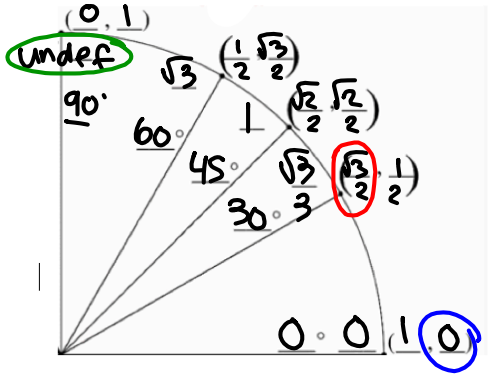
$\tan\theta = \frac{\sin\theta}{\cos\theta} = \frac{y}{x}$

Find the exact values of the following trig functions.

no decimal - use unit circle! $(\cos\theta, \sin\theta)$

17. $\cos 30°$ 18. $\tan 90°$ 20. $\sin 0°$

* $\frac{\sqrt{3}}{2}$ * undef. * 0



Using a calculator, find each angle measure to the nearest degree. Inverse!

21. $\sin B = .1835$ 22. $\tan\alpha = 0.7958$ 23. $\cos\beta = 0.5186$

$\sin^{-1}$ $\tan^{-1}$ $\cos^{-1}$

$\beta = \sin^{-1} .1835$ calc. $\alpha = \tan^{-1} 0.7958$ calc $\beta = \cos^{-1} 0.5186$ calc

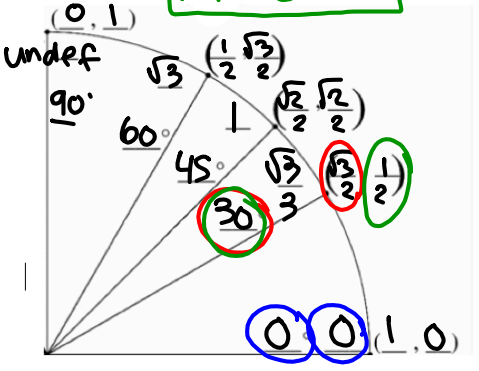
$\beta = 11°$ $\alpha = 39°$ $\beta = 59°$

WITHOUT using a calculator, find each exact angle measure. $(\cos\theta, \sin\theta)$

24. $\cos\theta = \frac{\sqrt{3}}{2}$ $\theta = 30°$

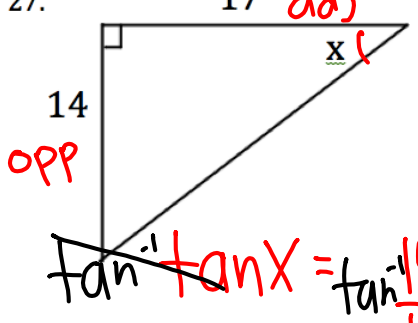
25. $\sin A = \frac{1}{2}$ $A = 30°$

26. $\tan F = 0$ $F = 0°$



Find the measure of the indicated angle to the nearest degree.

27.

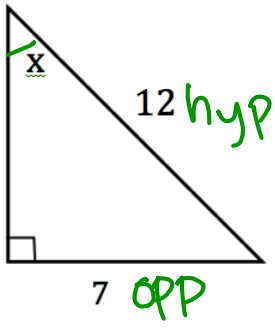


$\tan^{-1}\tan X = \tan^{-1}\frac{14}{17}$

$X = \tan^{-1}\frac{14}{17}$ calc

$X = 39°$

28.

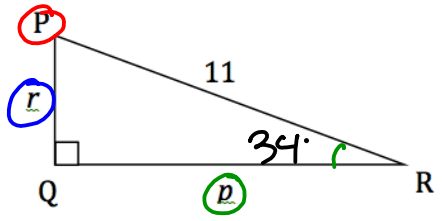


$\sin^{-1}\sin X = \sin^{-1}\frac{7}{12}$

$X = \sin^{-1}\frac{7}{12}$ calc

$X = 36°$

29. **Solve the right triangles.**



$\angle P \rightarrow 180-90-34$
$= 56°$

* $p = 9.1$ * $\angle P = 56°$
$q = 11$ $\angle Q = 90°$
* $r = 6.2$ $\angle R = 34°$

$11 \cdot \cos 34° = \frac{p}{11} \cdot 11$

$11 \cdot \cos 34°$ (calc) $= p$

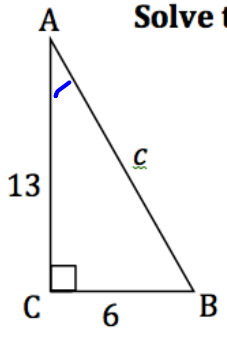
$9.1 = p$

$11 \cdot \sin 34° = \frac{r}{11} \cdot 11$

$11 \cdot \sin 34°$ (calc) $= r$

$6.2 = r$

30. **Solve the right triangles.**



$a^2 + b^2 = c^2$
$13^2 + 6^2 = c^2$
$169 + 36 = c^2$
$\sqrt{205} = \sqrt{c^2}$
$14.3 \approx c$

$a = 6$ * $\angle A = 24.8°$
$b = 13$ * $\angle B = 65.2°$
* $c = 14.3$ $\angle C = 90°$

$\tan A = \frac{6}{13}$

$A = \tan^{-1}\frac{6}{13}$

$A \approx 24.8$

$180 - 90 - 24.8° = 65.2°$

Review

Simplify

31. $3j^3k^{-2} \bullet 3j^{-2}k^4$

$3 \cdot 3 \cdot j^3 \cdot j^{-2} \cdot k^{-2} \cdot k^4$

$9 \cdot j^{3+-2} \cdot k^{-2+4}$

$9jk^2$

32. $(x^3z^5)^0$

anything raised to the power of 0 is always 1

33. $\dfrac{3a^4b^{-4}c^{-3}}{5a^2b^{-3}c^4}$

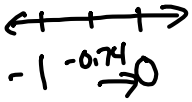
flip negatives

$\dfrac{3a^4b^3}{5a^2b^4c^4c^3}$

$\dfrac{3a^2}{5bc^7}$

34. [illegible]

$[0.74]$

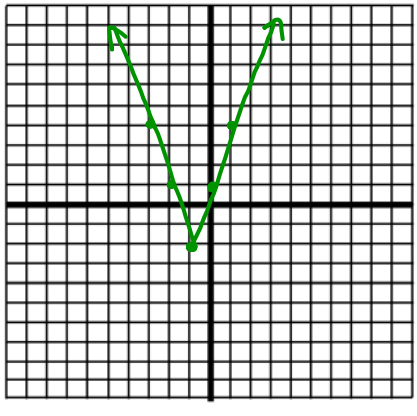


0

Graph the absolute value function.

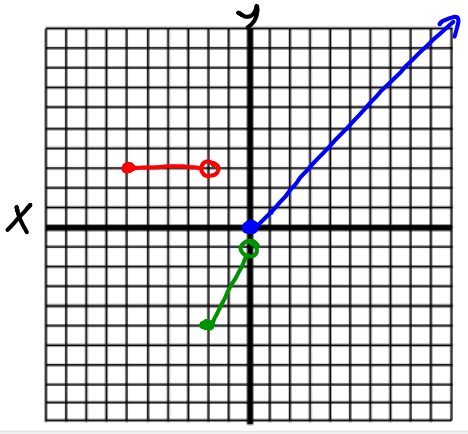
35. $f(x) = 3|x+1| - 2$

slope — x's lie — y-value



Graph each piecewise function.

36. $f(x) = \begin{cases} 3 \text{ if } -6 \le x < -2 \\ 2x-1 \text{ if } -2 \le x < 0 \\ x \text{ if } 0 \le x \end{cases}$



Piece x, y

3
(-6, 3) ●
(-2, 3) ○

2x-1
(-2, -5) ●
(0, -1) ○

x
(0, 0) ●
(1, 1) →

37. In the figure to the right list a pair of angles for the following terms:

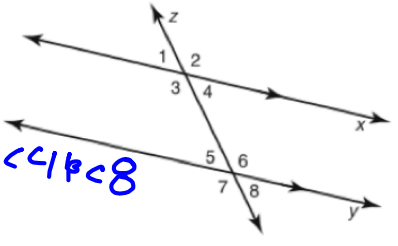
a. Alternate interior angles:
∠3 & ∠6 ∠4 & ∠5

b. Alternate exterior angles:
∠1 & ∠8, ∠2 & ∠7

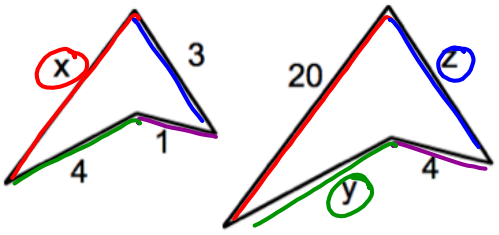
c. Corresponding angles:
∠1 & ∠5, ∠2 & ∠6, ∠3 & ∠7, ∠4 & ∠8

d. Same-side interior angles:
∠3 & ∠5, ∠4 & ∠6

e. Same-side Exterior angles:
∠1 & ∠7, ∠2 & ∠8



38. Solve the variables using the similar figures below.



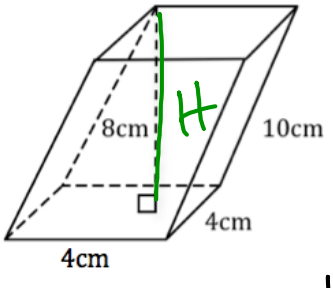
$\frac{x}{20} \times \frac{1}{4}$ $\frac{4x}{4} = \frac{20}{4}$

$\boxed{x = 5}$

$\frac{y}{4} \times \frac{4}{1} = \boxed{y = 16}$

$\frac{z}{3} \times \frac{4}{1}$ $\boxed{z = 12}$

39. Find the volume of the figure below.



Prism

$V = Ah$

Base rectangle

$A = l \cdot w$

$A = 4 \cdot 4 = 16$

$V = 16 \cdot 8$

$= \boxed{128\ cm^3}$