Lesson 1

Tuesday, March 23, 2010
1:31 PM

Big Welcome!

My Name: Errol

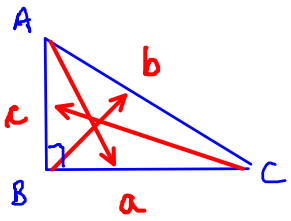
Physics 11

- Math Review

trigonometry (trigonometric ratios)

sin, cos, tan, sine law, cosine law

right angle triangles

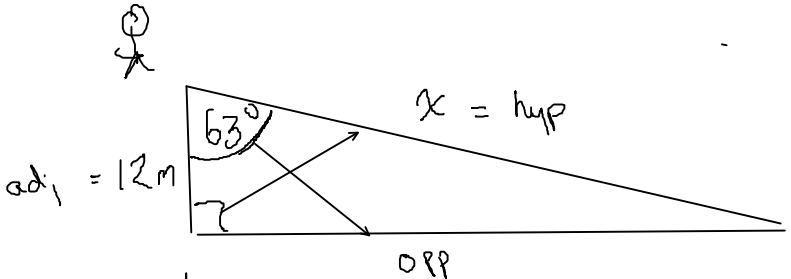


uppercase letters refer to ∠'s

SOHCAHTOA

$\sin\angle = \frac{opp}{hyp}$ $\tan\angle = \frac{opp}{adj}$

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



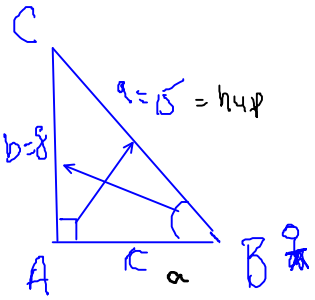
find x

$x \cdot \cos 63^\circ = \frac{12m}{x} \cdot x$

$$x \cdot \frac{\cos 63^\circ}{\cos 63^\circ} = \frac{12\,m}{\frac{x}{\cos 63^\circ}} \cdot x$$

$$x = \frac{12\,m}{\cos 63^\circ} = 26.4\,m$$

ex)



find $\angle B$
$\angle C$

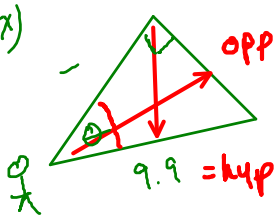
$\sin \angle B = \frac{8}{15} \Rightarrow \angle B = \sin^{-1}\left(\frac{8}{15}\right)$

$= \boxed{32.2^\circ}$

$\angle C = 180^\circ - 90^\circ - 32.2^\circ$

$= \boxed{57.8^\circ}$

ex)



"θ" Theta

refer angle

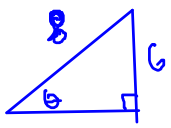
$\cos\theta = \frac{7}{9.9}$

$\cos\theta = 0.707$

$\theta = \cos^{-1}(.707)$

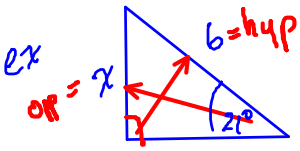
$= 45^\circ$

ex



$\theta = 48.8^\circ$ Nic

ex

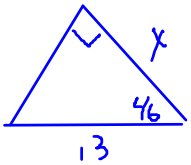


Find x

$6 \cdot \sin 21° = \frac{x}{6} \cdot 6$

$6 \cdot \sin 21° = x$

$= 2.2$



H/o Try 13 - 32 odd 20min

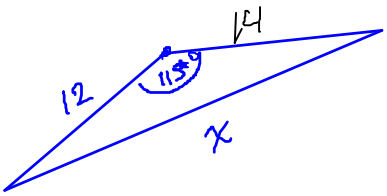
33) 33 - 39 odd

Sine law

$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$

cosine law

$c^2 = a^2 + b^2 - 2ab\cos C$

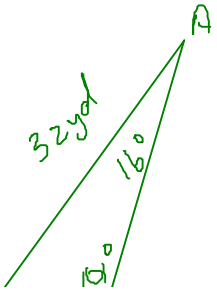


$x^2 = 12^2 + 14^2 - 2(12)(14)\cos 115$

$\vdots$

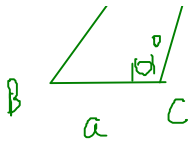
$x = 21.95, 22$

#43



$\frac{\sin A}{a} = \frac{\sin C}{c}$

$\frac{\sin A}{} = \frac{\sin A}{}$

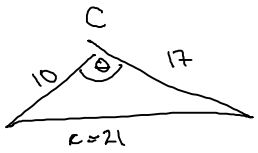


$$a = \frac{c \sin A}{\sin C}$$

$$= \frac{32\text{yd} \sin 16^\circ}{\sin 101^\circ}$$

$$a = 9 \text{ yd}$$

ex)

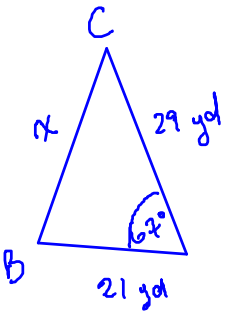


find θ

44 - 92

every 4th one.

69

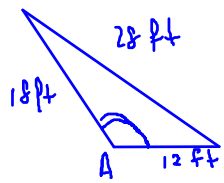


$$c^2 = a^2 + b^2 - 2ab\cos C$$

$$= 29^2 + 21^2 - 2(29)(21)\cos 67$$

$$= 28.4 \text{ yd}$$

79



Contained

$$c^2 = a^2 + b^2 - 2ab\cos C$$

$$28^2 = 18^2 + 12^2 - 2(12)(18)\cos A$$

whenever solving for unknown use Reverse Bedmas

$$28^2 = 18^2 + 12^2 - 2(12)(18)\cdot\cos A$$

$$\frac{(28^2 - 18^2 - 12^2)}{(-2\cdot 12\cdot 18)} = \frac{-2\cdot 12\cdot 18\cdot \cos A}{-2\cdot 12\cdot 18}$$

$$\cos A = -.73148$$

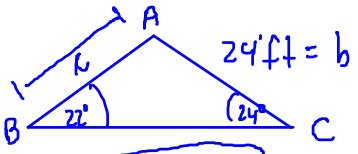
$A = \cos^{-1}\left(\frac{4}{5}\right)$

$= 137^\circ$

#68 - 87 ever 3rd me 20min

Sine law

#45



$\frac{\sin A}{a} = \boxed{\frac{\sin B}{b} = \frac{\sin C}{c}}$

$c \cdot \frac{\sin 22}{24} = \frac{\sin 24}{c} \cdot c$

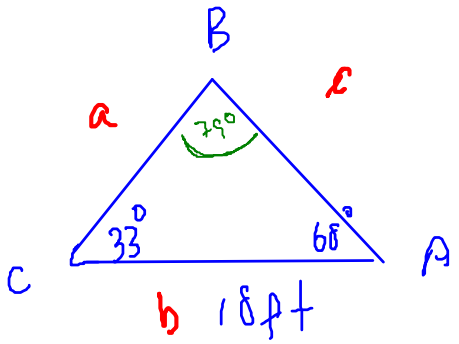
$c \cdot \frac{\frac{\sin 22^\circ}{24}}{\frac{\sin 22}{24}} = \frac{\frac{\sin 24^\circ}{1}}{\frac{\sin 22}{24}}$ } Invert and multiply

$c = \frac{\sin 24}{1} \cdot \frac{24}{\sin 22}$ } Inverted

$= \frac{\sin(24) \cdot 24}{\sin(22)} = 26.1\text{ ft}$

=

#47



$\frac{\sin 68}{a} = \frac{\sin 79}{18}$ $a = 17$ ft

49-67 every 3rd one

Algebra 2 Name_____ ID: 1

Assignment Date_____ Period____

Find the exact value of each trigonometric function.

1) cos −135°

2) cos 330°

3) cos −315°

4) tan 150°

5) tan 330°

6) sin −330°

7) sin −150°

8) sin 0°

9) cos 0°

10) cos 180°

11) sin −180°

12) tan −30°

Find the measure of each angle indicated. Round to the nearest tenth.

13)

14)

-1-

15)

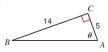
16)

17)

18)

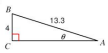
19)

20)



21)

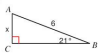
22)



Find the measure of each side indicated. Round to the nearest tenth.

23)

24)



25)

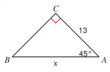
26)

27)

28)

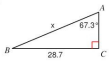
29)

30)



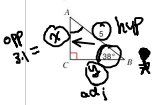
31)

32)



Solve each triangle. Round answers to the nearest tenth.

33)



$\sin 38 = \frac{x}{8}$

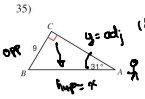
$x = 3.1$

$\cos 38 = \frac{y}{8}$

$y = 3.54$

34)

35)



$180 - 90 - 38 = 52°$

$\frac{x}{\sin 31} = \frac{9}{\sin 31}$

$x = 17.5$

36)

37)

38)

39)

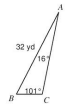
40)

41)

42)

Find each measurement indicated. Round your answers to the nearest tenth.

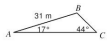
43) Find BC



44) Find BC

45) Find AB

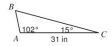
46) Find BC



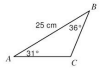
47) Find BC

48) Find AB

49) Find BC



50) Find AC



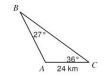
51) Find BC

52) Find AB

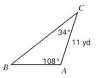
53) Find AC

54) Find AC

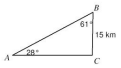
55) Find AB



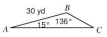
56) Find BC



57) Find AC

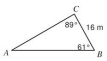


58) Find AC

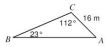


59) Find BC

60) Find AB



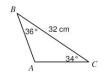
61) Find AB



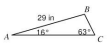
62) Find AC

Solve each triangle. Round your answers to the nearest tenth.

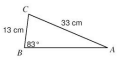
63)



64)



65)



66)

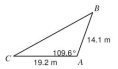
67)

Find each measurement indicated. Round your answers to the nearest tenth.

68) Find BC

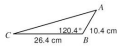
69) Find BC

70) Find BC

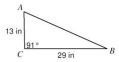


71) Find AB

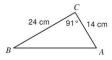
72) Find AC



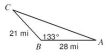
73) Find AB



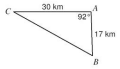
74) Find AB



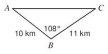
75) Find AC



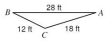
76) Find BC



77) Find AC

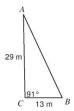


78) Find $m\angle A$

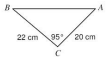


79) Find $m\angle A$

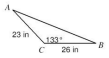
80) Find $m\angle A$



81) Find $m\angle A$

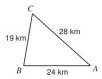


82) Find $m\angle A$



83) Find $m\angle A$

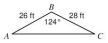
84) Find $m\angle B$



85) Find $m\angle C$

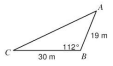
86) Find $m\angle A$

87) Find $m\angle C$



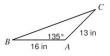
Solve each triangle. Round your answers to the nearest tenth.

88)

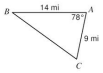


89)

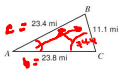
90)



91)



92)



$c = a$ $\quad 23.4^2 = 11.1^2 + 23.8^2 - 2(11.1)(23.8) \cdot \cos C$

$547.56 = 689.65 - 528.36 \cos C$

$-689.65 \quad -689.65$

$\frac{\sin A}{11.1} = \frac{\sin 74.4}{23.4}$ $\quad -142.09 = -528.36 \cos C$

$A = 27.2° \therefore B = 78.4°$ $\quad \frac{-142.09}{-528.36} = \frac{-528.36 \cos C}{-528.36}$

$\cos C = \frac{-142.09}{-528.36}$

$C = \cos^{-1}(\quad)$

$C = 74.4°$

#55 h) 0.0007160 $\times 10^5$ 4 sig figs

not important — important.

f) .00900 3 sig figs

Answers to Assignment (ID: 1)

1) $-\frac{\sqrt{2}}{2}$	2) $\frac{\sqrt{3}}{2}$	3) $\frac{\sqrt{2}}{2}$	4) $-\frac{\sqrt{3}}{3}$
5) $-\frac{\sqrt{3}}{3}$	6) $\frac{1}{2}$	7) $-\frac{1}{2}$	8) 0
9) 1	10) −1	11) 0	12) $-\frac{\sqrt{3}}{3}$
13) 45°	14) 70.5°	15) 45°	16) 41.8°
17) 55.2°	18) 48.6°	19) 29.8°	20) 70.3°
21) 61.6°	22) 17.5°	23) 10	24) 2.2
25) 9	26) 52.3	27) 10.9	28) 7.2
29) 14.9	30) 18.4	31) 12.3	32) 31.1

33) $m\angle A = 52°,\ b = 3.1,\ a = 3.9$ 34) $m\angle A = 42°,\ b = 2.2,\ a = 2$ 35) $m\angle B = 59°,\ b = 15,\ c = 17.5$
36) $m\angle B = 70.5°,\ m\angle A = 19.5°,\ b = 11.3$ 37) $m\angle B = 48.6°,\ m\angle A = 41.4°,\ a = 7.9$
38) $m\angle A = 34°,\ b = 2.5,\ a = 1.7$ 39) $m\angle B = 50.4°,\ m\angle A = 39.6°,\ b = 12.1$
40) $m\angle A = 50°,\ b = 12,\ c = 18.7$ 41) $m\angle B = 62°,\ b = 5.1,\ c = 5.8$ 42) $m\angle B = 53°,\ b = 8,\ c = 10$

43) 9 yd	44) 14 m	45) 26.1 ft	46) 13 m
47) 17 ft	48) 36 cm	49) 34 in	50) 16 cm
51) 26 in	52) 37.1 mi	53) 30.9 mi	54) 29 in
55) 31.1 km	56) 17 yd	57) 27.9 km	58) 43 yd
59) 12 ft	60) 32 m	61) 38 m	62) 13 ft

63) $m\angle A = 110°,\ b = 20$ cm, $c = 19$ cm
64) $m\angle B = 101°,\ b = 31.9$ in, $a = 9$ in
65) $m\angle C = 74°,\ m\angle A = 23°,\ c = 32$ cm
66) $m\angle C = 71°,\ c = 31.1$ in, $b = 24$ in
67) $m\angle A = 20.9°,\ m\angle C = 58.1°,\ c = 19$ mi
68) 11.8 km
69) 28.4 yd

70) 27.4 m	71) 43.7 yd	72) 32.9 cm	73) 32 in
74) 28 cm	75) 45 mi	76) 35 km	77) 17 km
78) 17°	79) 137°	80) 24°	81) 45°
82) 25°	83) 108°	84) 80.3°	85) 16.2°
86) 26.3°	87) 26.9°	88) $m\angle C = 25.4°,\ m\angle A = 42.6°,\ b = 41.1$ m	
89) $m\angle C = 36.4°,\ m\angle A = 43.6°,\ b = 10$ ft		90) $m\angle B = 20°,\ m\angle C = 25°,\ a = 26.8$ in	
91) $m\angle B = 36.1°,\ m\angle C = 65.9°,\ a = 15$ mi		92) $m\angle A = 27.2°,\ m\angle B = 78.4°,\ m\angle C = 74.4°$	

Sig figs - significant figures

Precision is limited in all measuring devices

∴ (therefore) the number of digits that are Valid is

∴ (therefore) the number of digits that are Valid is also limited

ex when looking at a meter stick, it is precise to the "mm" so when you measure the length of a pencil and say 21.4cm the ".4" digit is significant. If you measure an eraser and say it is 12.0 cm you are saying with great certainty that it is exactly 12.0 cm not 12.1cm or 11.9 cm
∴ 3 significant digits

How do we deal with "zero"
- if it used strictly for a place holder it is not significant

5600 kg 2 significant #'s

.0056 kg 2 significiant #'s

But .00560 3 significant #'s

why?

A) The first 2 "zero" are place holders but the last "zero", you are reporting that you are fairly precise in your measurement

ex 120 → 2 sig figs

120.0 → 4 sig figs

5600 2 sig figs

5600 2.8 x 10^5

Rules for determining significant digits

1) All non zero digits are significant
2) All final zeros following a decimal are significant
3) zeros between 2 significant digits are significant
4) zeros following whole #'s are Not significant

ex

245

19,873

5

245.0

19,873.00

5.000000

0.00245

0.19873

0.0005

2045

20045

200 45.0

Multiplying and dividing using Significant digits

when multiplying/dividing determine the significant digits of each term and your final answer S/b should be reported using the least # of significant digits

eg $3.5 \times 7 = 24.5 \doteq 25$

3.5: 2 sis fis; 7: 1 sig fig; 24.5: this answer must be 1 sis fis how?

what # is close to 24.5 but have 1 sis fig choices are 30 or 20

A) 20 (must use rounding rules)

ex) $32 \div 60 \times 12.5 =$

32: 2 sig fis; 60: 2 sis fis; 12.5: 3 sis fis; must be 2 sis fis

A) = 67

ex $0.0036 \times 0.02 = 7.2 \times 10^{-5}$

(2 sig figs) × (1 sig fig) = (1 sig fig)

$= 7.0 \times 10^{-5}$

$A = 7 \times 10^{-5}$

Adding + Subtracting using Sig Figs.

Rules are slightly different.

32.5 cm is precise to the 10th of a cm

18.07 cm is precise to the 100th of a cm

when adding + subtracting, your final answer will be to the least precise digit.

ex

$$\begin{array}{r} 32.5 \text{ cm} \\ +\ 18.07 \text{ cm} \\ \hline 50.57 \text{ cm} \end{array}$$

final answer must be to the 10th of a cm

∴ 50.6 cm (using rounding rules)

ex add 24.686 m + 2.343 m + 3.21 m

(1 dec. place) (1 dec. place) (1 dec. place)

A =

$$\begin{array}{r} 24.686\ m \\ 2.343\ m \\ 3.21\ m \\ \hline 30.239\ m \end{array}$$

$\doteq$ 30.24 m

but since the last term is precise to 100^{th} m, final ans is reported to 100^{th}

ex

$$\boxed{\frac{3.65}{.3354}} - \boxed{\frac{6.14}{0.1766}}$$

$$10.9 - 34.8 = \boxed{-23.9}$$

56 a c e g

57 a c e g

5 8 a c e g

5 9 a c e