

Unit 5 Right Triangles

TEST REVIEW -

HONORS
MATH 2

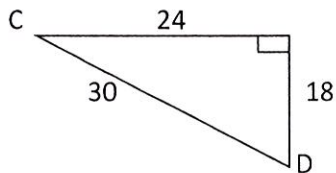
NAME _____

KEY

DATE _____

PERIOD _____

Use the triangle to write the ratios. (Write as a fraction and reduce fractions when necessary.)



1. $\sin C = \frac{18}{30} = \frac{3}{5}$
 3. $\cos C = \frac{24}{30} = \frac{4}{5}$
 5. $\tan C = \frac{18}{24} = \frac{3}{4}$

2. $\sin D = \frac{24}{30} = \frac{4}{5}$
 4. $\cos D = \frac{18}{30} = \frac{3}{5}$
 6. $\tan D = \frac{24}{18} = \frac{4}{3}$

Calculator Exercises: (Please list 3 decimals.)

NOTE: Make sure your calculator is in "DEGREE MODE"

37. $\sin 17^\circ = .292$

8. $\cos 25^\circ = .906$

9. $\tan 82.5^\circ = 7.596$

Calculator Exercises: (Please round to the nearest whole number degree.)

10. $\cos 45^\circ = .707$

11. $\tan 85^\circ = 11.430$

12. $\sin 60^\circ = .866$

Matching.

Sometimes in trig application problems, you use regular sin, cos and tan. Other times you will use "inverse functions" - \sin^{-1} , inverse sine; \cos^{-1} , inverse cosine and \tan^{-1} , inverse tangent. Use REGULAR or INVERSE

inverse 13. Which would help find $\tan B = 18.627$?

regular 14. Which would help find $\tan 57^\circ = X$?

Use INVERSE to find angles!

Multiple Choice.

A 15. Which trig function would be BEST to use?
 A. sine B. cosine C. tangent

C 16. Which trig function would be BEST to use?
 A. sine B. cosine C. tangent

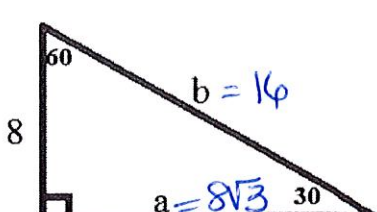
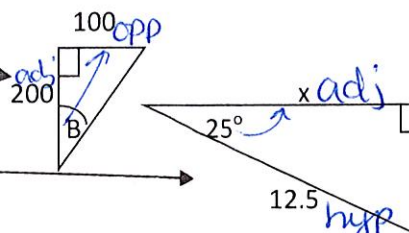
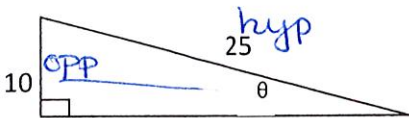
B 17. Which trig function would be BEST to use?
 A. sine B. cosine C. tangent

C 18. The length of side "a" would be...
 A. 8 B. 16
 C. $8\sqrt{3}$ D. $8\sqrt{2}$

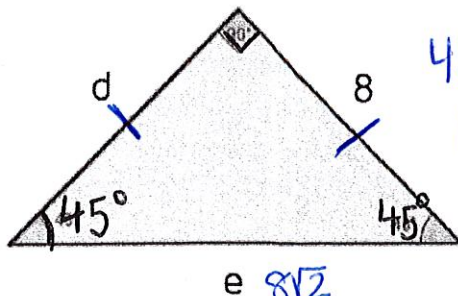
B 19. The length of side "b" would be...
 A. 8 B. 16
 C. $8\sqrt{3}$ D. $8\sqrt{2}$

A 20. The length of side "d" would be...
 A. 8 B. 16
 C. $8\sqrt{3}$ D. $8\sqrt{2}$

D 21. The length of side "e" would be...
 A. 8 B. 16
 C. $8\sqrt{3}$ D. $8\sqrt{2}$



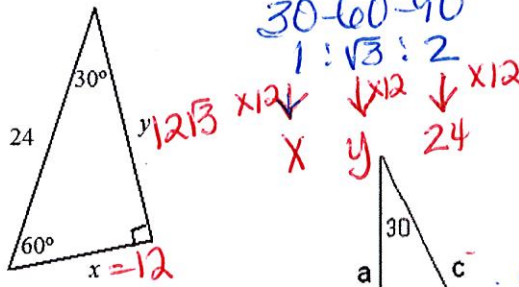
30-60-90
 1 : $\sqrt{3}$: 2 ratio



45-45-90
 1 : 1 : $\sqrt{2}$

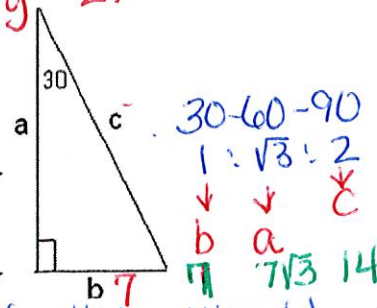
D 22. Find length of "x" and "y"

- A. $x = 12\sqrt{2}, y = 12$
- B. $x = 12, y = 12\sqrt{2}$
- C. $x = 12\sqrt{3}, y = 12$
- D. $x = 12, y = 12\sqrt{3}$



D 23. If $b = 7$, then the value of c to the nearest tenth is...

- a) 8.5
- b) 9.9
- c) 12.1
- d) 14.0



C 24. If $b = 7$, then the value of a to the nearest tenth is...

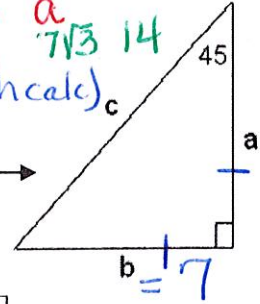
- a) 8.5
- b) 9.9
- c) 12.1
- d) 14.0

$7\sqrt{3} = 12.12$ (multiply with calc)

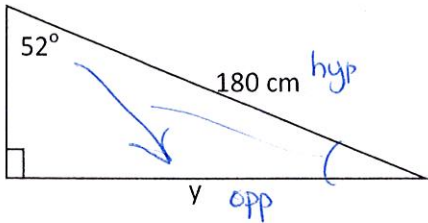
A 25. If $b = 7$, then the value of c to the nearest tenth is...

- a) 9.9
- b) 10.5
- c) 12.1
- d) 7

$7\sqrt{2} = 9.899$
 $45-45-90$
 $1:1:\sqrt{2}$
 $a:b:c$
 $7:7:7\sqrt{2}$



Solve the following triangles for the missing parts:



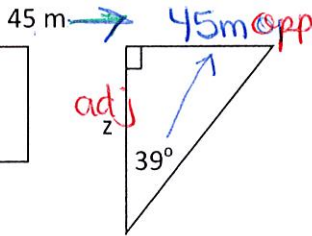
26. Trig Sentence:

$$\sin 52^\circ = \frac{y}{180}$$

27. $y = 141.8$ (round to nearest tenth)

28. Trig Sentence:

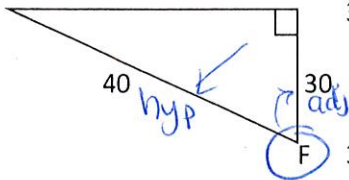
$$\tan 39^\circ = \frac{45}{z}$$



29. $z = 55.6^\circ$ (round to nearest tenth)

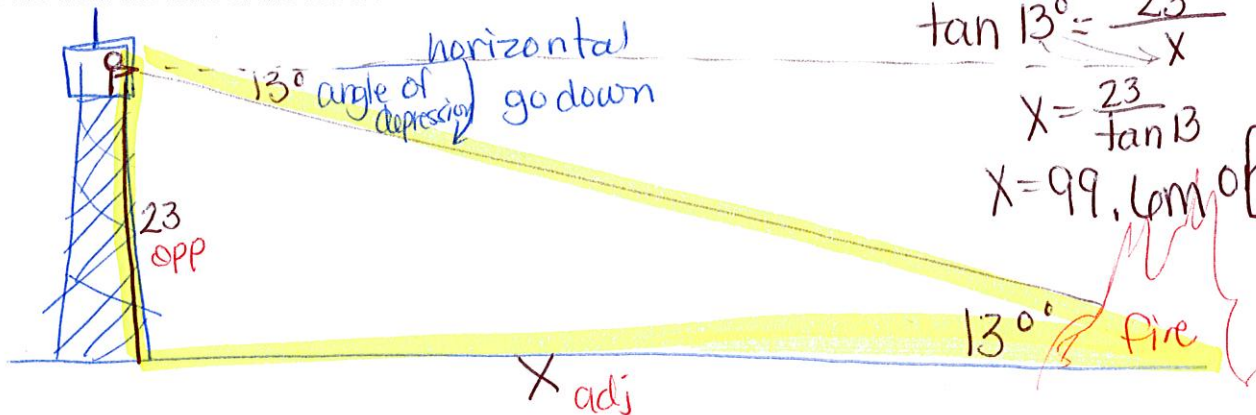
30. Trig Sentence to solve for angle F:

$$\cos F = \frac{30}{40}$$



31. Angle F = 41° (round to nearest degree)

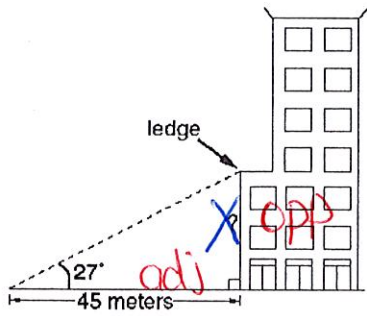
32. A lookout spots a fire from a 23-m tower. The angle of depression to the fire is 13° . To the nearest meter, how far is the fire from the base of the tower?



$$\tan 13^\circ = \frac{23}{x}$$

$$x = \frac{23}{\tan 13}$$

$$x = 99.6 \text{ m} \approx 100 \text{ m}$$



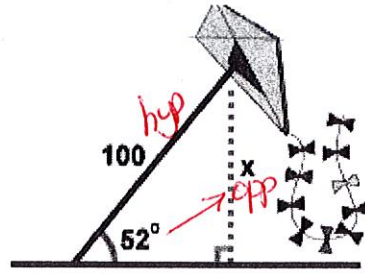
33. How far up to the ledge?

$$45 \cdot \tan 27^\circ = \frac{x}{45} \cdot 45$$

$$x = \tan(27) \cdot 45$$

multiply

ledge = 22.9 m



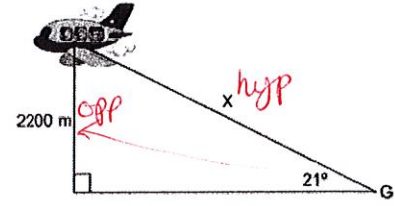
34. How high is the kite?

$$100 \cdot \sin 52^\circ = \frac{x}{100} \cdot 100$$

multiply

$$x = \sin(52) \cdot 100$$

The kite is 78.8 high.



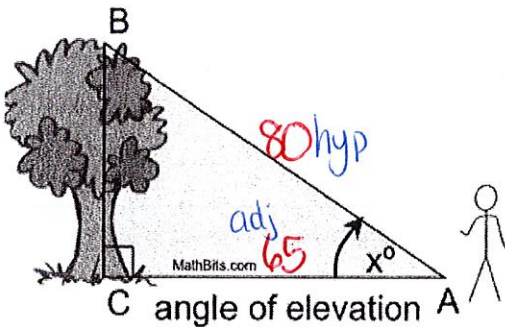
35. Find "x"

$$\sin 21^\circ = \frac{2200}{x}$$

Divide

$$x = \frac{2200}{\sin(21)}$$

x = 6138.9 m
or 6139 m



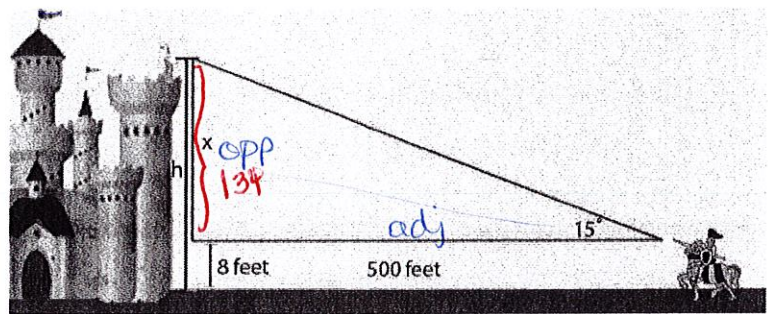
36. If AB = 80 and AC = 65, what is x° ?

$$\cos x^\circ = \frac{65}{80}$$

USE INVERSE

$$x = \cos^{-1}\left(\frac{65}{80}\right)$$

$$x = 36^\circ$$



37. A "knight" in shining armor is attempting rescue to "damsel in distress" at the top of the tower.

A. Write a trig sentence to solve for x:

$$\tan 15^\circ = \frac{x}{500}$$

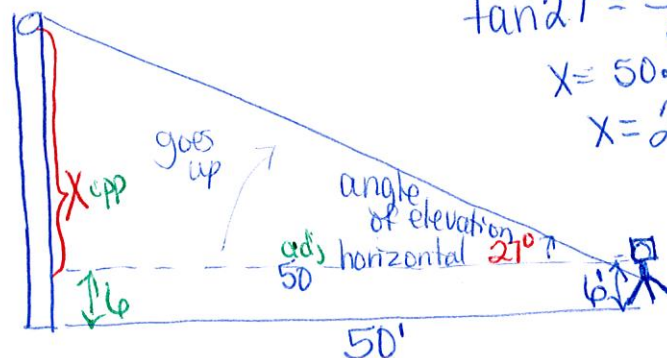
multiply

$$x = \tan(15) \cdot 500$$

B. Solve for x. x = 134 ft. or (133.97)

C. Total height of damsel from the ground = 134 + 8 = 142 ft

38. To find the height of a pole, a surveyor moves 50 feet away from the base of the pole and then, with transit in hand 6 feet tall, measures the angle of elevation to the top of the pole to be 27° . What is the height of the pole. Round your answer to the nearest foot.



$$\tan 27^\circ = \frac{x}{50}$$

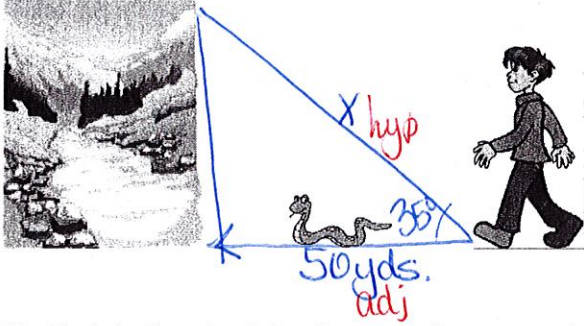
$$x = 50 \cdot \tan(27)$$

$$x = 25.47$$

must add to height of transit

$$25 + 6 = 31 \text{ ft}$$

39. Chris wants to walk to the river 50 yards away, but there is a snake in his path, so he turns at an angle of 35° and takes a longer route to the river. How much out of his way did Chris walk because of the snake?

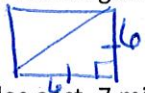


$$\cos 35^\circ = \frac{50}{X}$$

$$X = \frac{50}{\cos(35^\circ)} = 61 \text{ yds.}$$

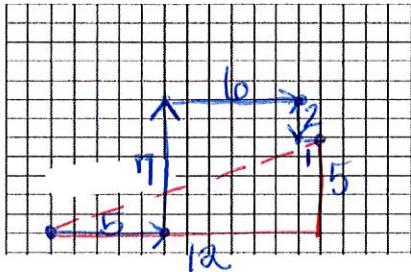
$$\frac{61 \text{ yd.} - 50 \text{ yds.}}{11 \text{ yds out of the way}}$$

40. Find the length of the diagonal of a square whose side is 6 in.-in-length.



$$6\sqrt{2} \text{ in or } 8.48 \text{ in}$$

41. Terry drove 5 miles east, 7 miles north, 6 miles east, 2 miles south, and 1 mile east. How far is he from his starting point?



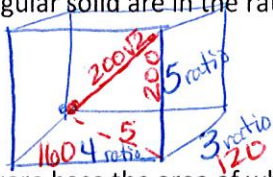
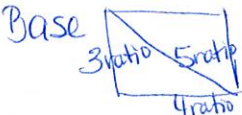
Grid paper is provided

could make a right triangle use pythagorean thm

5-12-13 is a pythag. triple.

$$\text{Distance from start} = 13 \text{ m}$$

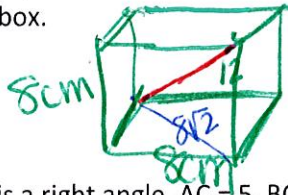
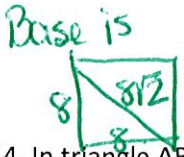
42. The dimensions of a rectangular solid are in the ratio 3:4:5. If the interior diagonal is $200\sqrt{2}$, find the three dimensions.



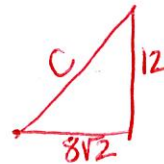
The interior diagonal is part of a 45-45-90 special right triangle with hypotenuse = $200\sqrt{2}$
scale factor = 40

$$\boxed{120, 160, 200}$$

43. A rectangular box has a square base the area of which is 64 cm^2 . The height of the box is 12 cm. Find the length of the interior diagonal of the box.



A = 64 cm means 8 cm x 8 cm



$$12^2 + (8\sqrt{2})^2 = C^2$$

$$144 + 64 \cdot 2 = C^2$$

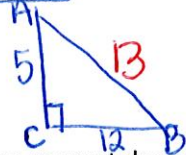
$$144 + 128 = C^2$$

$$272 = C^2$$

$$\boxed{16.49 \text{ cm}}$$

44. In triangle ABC, angle C is a right angle, AC = 5, BC = 12.

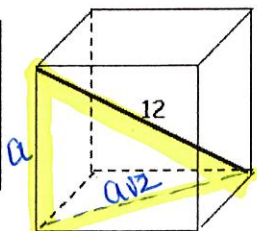
- Find AB. = 13
- Find the tan B. $\frac{5}{12}$
- Find sin B. $\frac{5}{13}$
- Find cos B. $\frac{12}{13}$
- Find the measure of angle B to the nearest degree.



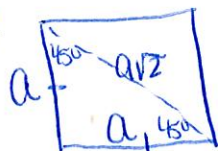
pythagorean triple 5-12-13

use inverse of any one b, c, or d.
angle B = 22.6° or $\boxed{23^\circ}$

CHALLENGE: If 12 is length of interior diagonal, how long is each side of the cube?



Base



unknown value of "a" but it is $45^\circ-45^\circ-90^\circ$

Pythagorean thm.

$$a^2 + (a\sqrt{2})^2 = 12^2$$

$$a^2 + a^2 \cdot 2 = 144$$

$$a^2 + 2a^2 = 144$$

$$3a^2 = 144$$

$$\frac{3a^2}{3} = \frac{144}{3}$$

$$\sqrt{a^2} = \sqrt{48}$$

$$a = \sqrt[4]{16 \cdot 3}$$

$$\boxed{a = 4\sqrt{3} \text{ or } 6.9}$$