Unit 5 Day 3
Using Trigonometry

Need Class Sets (1/2 set for sleeves) for today:
What's Green & Loud Puzzle

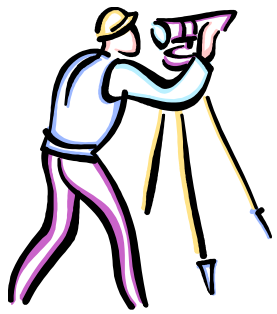
Warm-up

Round Answers To The Nearest Tenth.

1. A tree casts a shadow 21m long while the sun's angle of elevation is 51°. What is the height of the tree?
2. A guy wire reaches from the top of a 120m TV tower to the ground making an angle of 63° with the ground. Find the length of the wire.
3. A 40 foot escalator rises to a height of 21 feet. What is the angle of inclination (elevation) of the escalator?

ALSO….

- **Have your clinometer out on your desk!**
- **At some point during the warm-up, measure the height of your eyes above the ground (use meter sticks taped by the door)**
  - **Take your partner with you!**
  - **Write it on the top of your lab sheet (pick one up!)**
  - **Eye level should be measured in inches, convert to feet**



Warm-up

Solutions

1. A tree casts a shadow 21m long while the sun's angle of elevation is 51°. What is the height of the tree?

$$\tan(51) = \frac{x}{21} \qquad x = 25.9$$

2. A guy wire reaches from the top of a 120m TV tower to the ground making an angle of 63° with the ground. Find the length of the wire.

$$\sin(63) = \frac{120}{x} \qquad x = 134.7$$

3. A 40 foot escalator rises to a height of 21 feet. What is the angle of inclination (elevation) of the escalator?

$$\sin(x) = \frac{21}{40} \qquad x = \sin^{-1}\left(\frac{21}{40}\right) \qquad x = 31.7^\circ$$

Homework Solutions

Packet Page 3 Evens

2. 5/13
4. 12/5
6. 5/13
8. 0.8660
10. 0.9816
12. 61
14. 50
16. 39
18. 19
20. 34
22. X=17; y=11

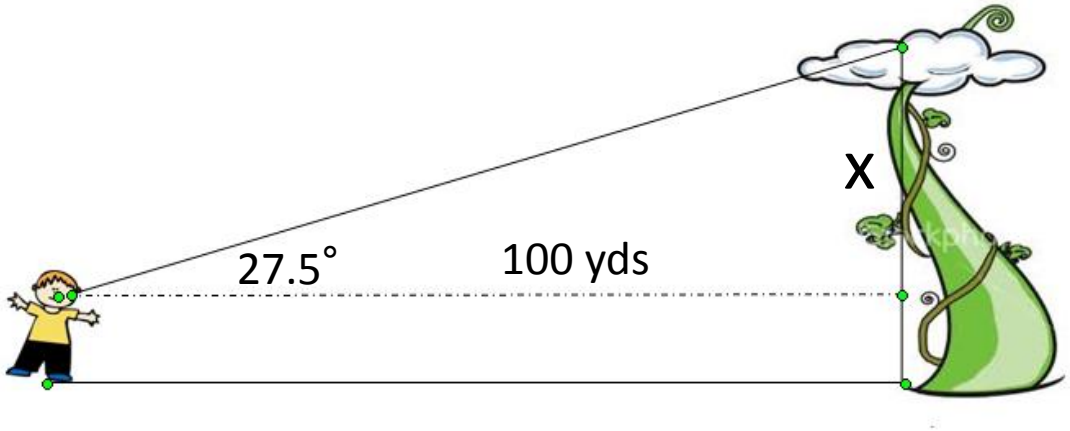
Homework Solutions

Packet Page 4 All

1. 143.5 ft.
2. 3.4 in. by 4.9 in.
3. 4.5 inches
4. 144.9 ft.
5. 48.2°
6. 5692.3 m.
7. 62.4 m.
8. 33.6 m.

Clinometer lab…the in class part…

In class: Jack was bragging about climbing a beanstalk. One of his friends, tired of hearing the story for the umpteenth time asked, "Jack, how tall was the beanstalk?" Knowing that his friends would pester him forever, Jack decided to find out…



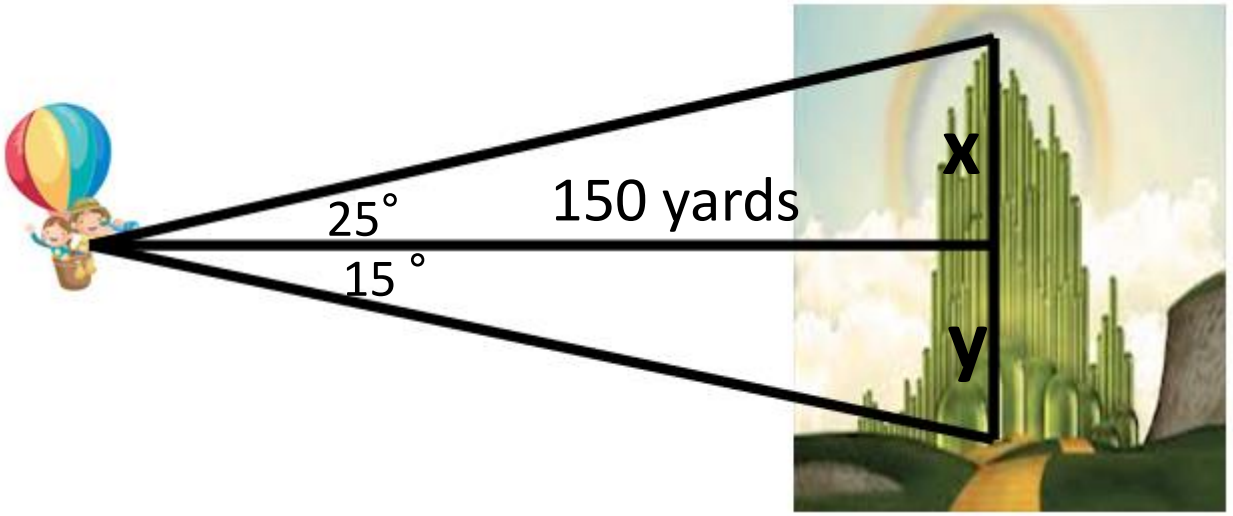
Jack stood 100 yards away from the point directly under where the beanstalk meets the clouds and used his clinometer to look at the top of the stalk (where it met the clouds). He measured the angle of elevation to be 27.5°. Using this information, what is the distance from the top of the beanstalk to Jack's line of sight? 52.06 yds (156.18 ft)

Jack then measured from his eyes to the ground (it was 48 inches). He then concluded that the stalk was 160.18 feet tall.

156.18 ft + 4 ft = 160.18 ft

- While flying in a hot air balloon, Dorothy and the Wizard looked back at the Emerald City. Dorothy wondered, "How high was that lovely green castle?" Using her clinometer, she decided to find out! She knew (using her range finder) that the horizontal distance to the city was 150 yards.
- Dorothy measured the angle of depression from the balloon to the base of the emerald castle to be 15^o and the angle of elevation to the top of the castle to be 25^o. Based on these measurements, how tall is the castle?

69.95 + 40.19 = 110.14 yards



1) pick which angle 2) point the arrow at your object 3) tilt the clinometer

Angle of elevation

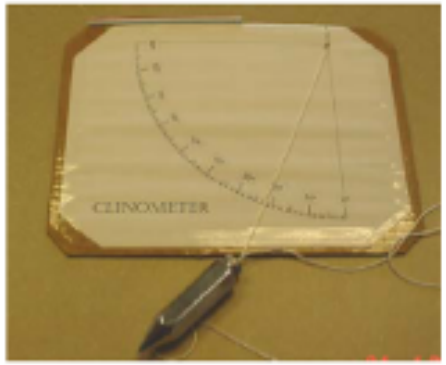
Angle of depression

3) Tape a straw along the top edge of the cardboard

1) Tape or glue this sheet to a piece of cardboard.
This edge must be *parallel* to the edge of the cardboard

Hole A

2) Tie a weight (e.g. washers) to a string.
Carefully punch a hole through point A.
Thread string with weight through hole A.
Tie the string so that it stays in the hole.



4) Aim the clinometer at the object.
Use the straw as a sighting guide.

5) Use the string to read the angle of elevation or depression.

CLINOMETER

Clinometer Lab Time!

Use a partner for help…they'll tell you your angle measurements! ☺

I'll show you how to use your clinometer to measure the angles now, before we go outside!

Angles to find:

- By the softball dugout – heels in line with right side of dugout
  - measure angle of elevation to the top of the lightpost
- By the bus parking lot, from ⊥ intersection of sidewalks
  - measure angle of elevation to top of school building
  - Measure angle of depression to base of school building

You should bring:

***Clinometer** ***Pencil**

***Calculator** ***Lab Sheet**

***Something To Write On**

After you finish the lab sheet….

Triangle Trig Application Practice

Puzzle ☺

What's Green and Loud?

"A Frog Horn"

Right Triangle Trig

- https://play.kahoot.it/#/?quizId=46e6cd5d-4c2b-4f3e-b0ac-d0f2256a36a0

Homework

Packet Page 5 AND Packet Page 6