

ACT Activities

Examples align to Architecture & Construction course standards

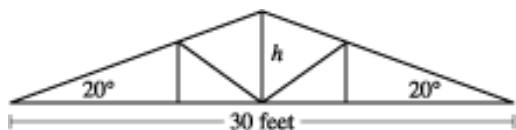
Career Cluster: Architecture & Construction

Mathematics in *Structural Systems* – Addresses Standard 21

Mathematics in *Residential & Commercial Construction II* – Addresses Standard 8

Question

Which of the following expressions is the closest approximation to the height h , in feet, of the roof truss shown below?



- A. $15 \tan 20^\circ$
- B. $15 \sin 20^\circ$
- C. $30 \tan 20^\circ$
- D. $30 \sin 20^\circ$
- E. $\frac{15}{\sin 20^\circ}$

Source: Sample Mathematics Questions: Set 4. (2016). *Math Questions*. ACT, Inc., Retrieved from http://www.actstudent.org/sampletest/math/math_04.html

The correct answer is A. $15 \tan 20^\circ$

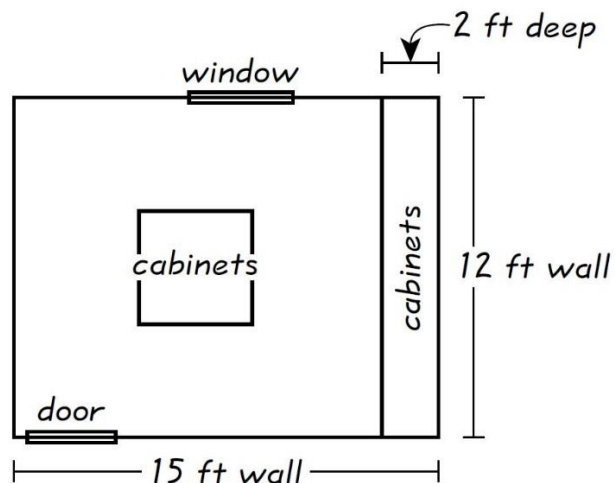
$YZ = \frac{1}{2}XZ = \frac{1}{2}(30) = 15$. So, $\tan 20^\circ = \frac{h}{YZ} = \frac{h}{15}$. Then, $h = 15 \tan 20^\circ$.

Career Cluster: Architecture & Construction

Mathematics in *Fundamentals of Construction* Addresses Standards 12, 18

Question

Gianna is converting a 12-foot-by-15 foot room in her house to a craft room. Gianna will install tile herself but will have CC Installations build and install the cabinets. The scale drawing shown below displays the location of the cabinets in the craft room (0.25 inch represents 2 feet).



Cabinets will be installed along one of the 12-foot walls from floor to ceiling, and 4 cabinets that are each 3 feet tall will be installed in the middle of the room. These are the only cabinets that will be installed, and each of them will be 2 feet wide and 2 feet deep. CC Installations has given Gianna an estimate of \$2,150.00 for building and installing the cabinets.

33. A 15-foot wall is how many inches long in the scale of the drawing?

- A. 1.5
- B. 1.875
- C. 3
- D. 3.375
- E. 3.75

34. Gianna will install tile on the portion of the floor that will NOT be covered by cabinets. What is the area, in square feet, of the portion of the floor that will NOT be covered by cabinets?

- F. 72
- G. 90
- H. 140
- J. 156
- K. 164

35. CC Installations' estimate consists of a \$650.00 charge for labor, plus a fixed charge per cabinet. The labor charge and the charge per cabinet remain the same for any number of cabinets built and installed. CC Installations would give Gianna what estimate if the craft room were to have twice as many cabinets as Gianna is planning to have?

- A. \$2,800.00
- B. \$3,000.00
- C. \$3,450.00
- D. \$3,650.00
- E. \$4,300.00