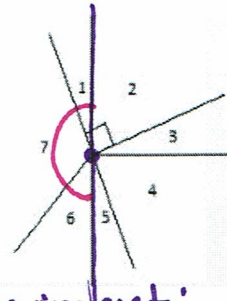


Math 2 NCFE Practice: Geometry

D 1. Which of the following angles are supplementary in the figure shown on the right?

- A.  $\angle 1$  and  $\angle 6$
- B.  $\angle 1$  and  $\angle 2$
- C.  $\angle 1$  and  $\angle 5$
- D.  $\angle 1, \angle 6$  and  $\angle 7$



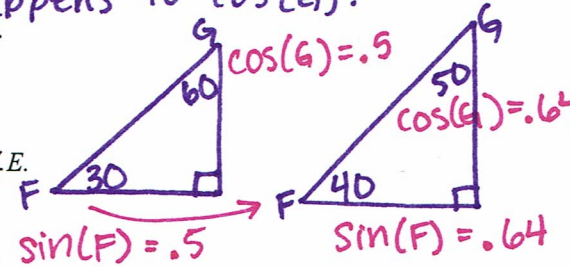
B 2. Angles  $F$  and  $G$  are complementary angles.

- As the measure of angle  $F$  varies from a value of  $x$  to a value of  $y$ ,  $\sin(F)$  increases by 0.2.

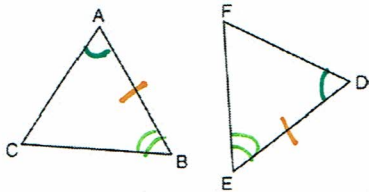
Experiment:  
Say angle  $F$  varies from  $30^\circ$  to  $40^\circ$ .  
The  $\sin(F)$  will increase. Check out what happens to  $\cos(G)$ :

How does  $\cos(G)$  change as  $F$  varies from  $x$  to  $y$ ?

- A. It increases by a greater amount.
- B. It increases by the same amount.
- C. It increases by a lesser amount.
- D. It does not change.



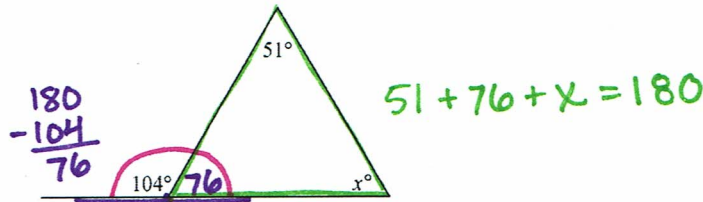
C 3. In the diagram of  $\triangle ABC$  and  $\triangle DEF$  below,  $\overline{AB} \cong \overline{DE}$ ,  $\angle A \cong \angle D$ , and  $\angle B \cong \angle E$ .



Which method can be used to prove  $\triangle ABC \cong \triangle DEF$ ?

- A. SSS
- B. SAS
- C. ASA
- D. AAS

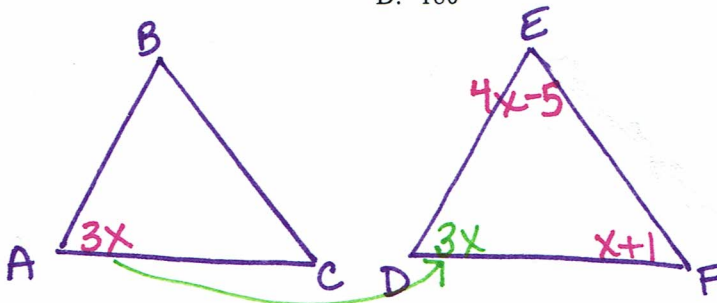
D 4. Find the value of  $x$ . (Note: The diagram is not to scale.)



- A. 141
- B. 127
- C. 76
- D. 53

B 5. If  $\triangle ABC \cong \triangle DEF$ ,  $m\angle A = 3x$ , and  $m\angle E = 4x - 5$ , and  $m\angle F = x + 1$ , what is  $m\angle B$ ?

- A.  $23^\circ$
- B.  $87^\circ$
- C.  $69^\circ$
- D.  $180^\circ$



$$3x + 4x - 5 + x + 1 = 180$$

$$8x - 4 = 180$$

$$8x = 184$$

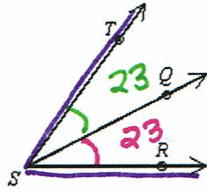
$$x = 23$$

$$m\angle B = 4x - 5$$

$$= 4(23) - 5$$

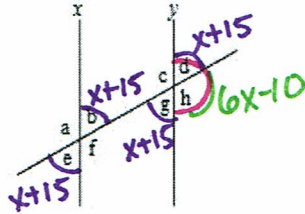
$$= 87$$

- B 6.  $\overline{SQ}$  bisects  $\angle RST$ , and  $m\angle RSQ = 23^\circ$ . What is the measure of  $\angle RST$ ? The diagram is not to scale.



- A.  $23^\circ$       B.  $46^\circ$       C.  $45^\circ$       D.  $90^\circ$

- D 7. Find the measure of  $\angle g$  if  $x \parallel y$ ,  $m\angle b = x + 15$  and  $m\angle h = 6x - 10$ . (Note: The diagram is not to scale.)



$$\begin{aligned} x+15 + 6x-10 &= 180 \\ 7x+5 &= 180 \\ 7x &= 175 \\ x &= 25 \end{aligned}$$

$$\begin{aligned} m\angle g &= x+15 \\ &= 25+15 \\ &= 40 \end{aligned}$$

- A. 5      B. 20      C. 25      D. 40

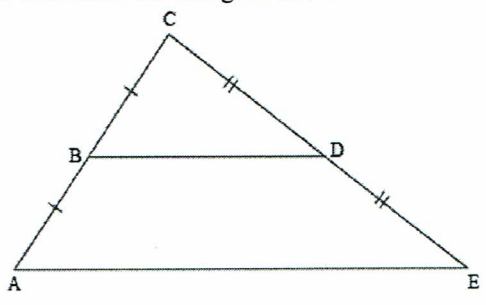
- D 8. The scale on a map of the US reads "1 inch = 200 miles." If New York is 4.5 inches from Florida, what is the actual distance between the cities?

- A. 44 miles      C. 200 miles  
B. 450 miles      D. 900 miles

$$\frac{1}{200} = \frac{4.5}{x}$$

cross multiply:  
 $1x = (4.5)(200)$   
 $x = 900$

- C 9. Which statement must be true about the triangle below?

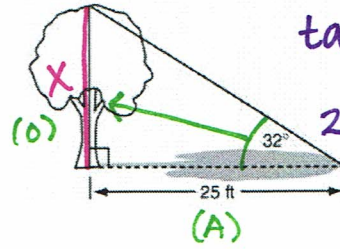


- A.  $CB + BA = CD + DE$   
 B.  $\triangle CBD \cong \triangle CAE$   
C.  $AE = 2 \cdot BD$       Midsegment Theorem  
 D.  $\angle S \cong \angle T$

- B** 10. A tree casts a 25-foot shadow on a sunny day, as shown in the diagram on the right.

If the angle of elevation from the tip of the shadow to the top of the tree is  $32^\circ$ , what is the height of the tree to the nearest tenth of a foot?

- A. 13.2 feet  
**B.** 15.6 feet  
 C. 21.2 feet  
 D. 40.0 feet



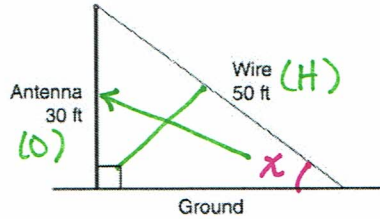
$$\tan(32) = \frac{x}{25}$$

$$25 \cdot \tan(32) = x$$

- A** 11. A communications company is building a 30-foot antenna to carry cell phone transmissions. As shown in the diagram below, a 50-foot wire from the top of the antenna to the ground is used to stabilize the antenna.

Find, to the nearest degree, the measure of the angle that the wire makes with the ground.

- A.**  $37^\circ$   
 B.  $53^\circ$   
 C.  $40^\circ$   
 D.  $31^\circ$

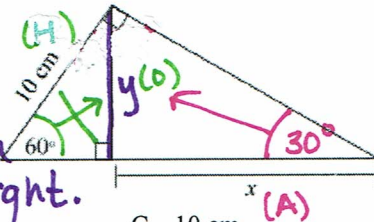


$$\sin(x) = \frac{30}{50}$$

$$\sin^{-1}\left(\frac{30}{50}\right) = x$$

- D** 12. What is the value of  $x$  in the triangle below?

Goal: Use the left triangle to solve for side  $y$ , because  $y$  is also in the triangle with  $x$  on the right.



- A.  $\frac{5\sqrt{3}}{2}$  cm  
 B.  $5\sqrt{3}$  cm  
 C. 10 cm  
**D.** 15 cm

$$\sin(60) = \frac{y}{10}$$

$$10 \cdot \sin(60) = y$$

$$8.66 = y$$

$$\tan(30) = \frac{y}{x}$$

$$\tan(30) = \frac{8.66}{x}$$

$$x = \frac{8.66}{\tan(30)}$$

$$x = 15$$

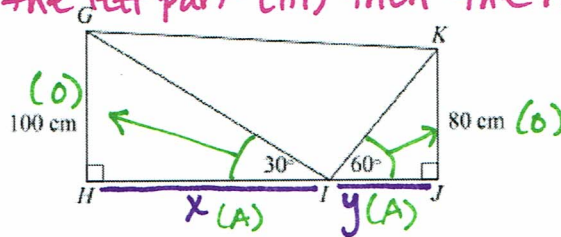
- C** 13. What is the approximate length of  $HJ$  in the diagram below?

Goal: solve for the left part (HI) then the right part (IJ).

$$\tan(30) = \frac{100}{x}$$

$$x = \frac{100}{\tan(30)}$$

$$x = 173.2$$



$$\tan(60) = \frac{80}{y}$$

$$y = \frac{80}{\tan(60)}$$

$$y = 46.2$$

- A. 292 cm  
 B. 265 cm  
**C.** 219 cm  
 D. 196 cm

$$HJ = HI + IJ$$

$$= 173.2 + 46.2$$

$$= 219.4$$

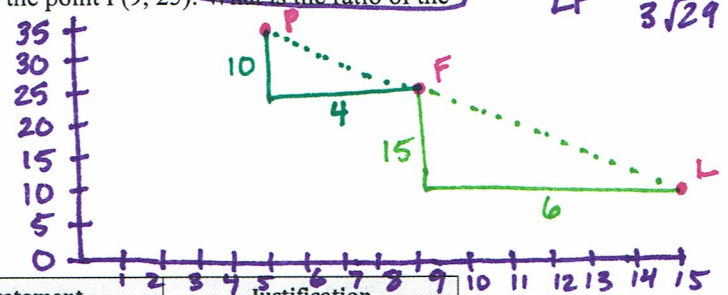


**A** 14. A city map is placed on a coordinate grid. The post office is located at the point P(5, 35), the library is located at the point L(15, 10), and the fire station is located at the point F(9, 25). What is the ratio of the length of PF to the length of LF?  $\rightarrow \frac{PF}{LF} = \frac{2\sqrt{29}}{3\sqrt{29}} = \frac{2}{3}$

A. 2:3  
 B. 3:2  
 C. 2:5  
 D. 3:5

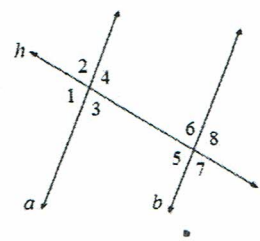
$10^2 + 4^2 = c^2$   
 $100 + 16 = c^2$   
 $\sqrt{116} = c$   
 $2\sqrt{29} = c$

$15^2 + 6^2 = c^2$   
 $225 + 36 = c^2$   
 $\sqrt{261} = c$   
 $3\sqrt{29} = c$



**C** 15. Complete the proof using the figure provided.

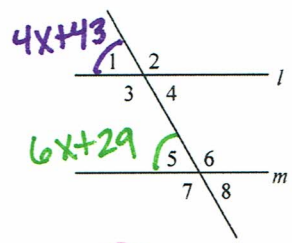
Given:  $a \parallel b$   
 Prove:  $\angle 2 \cong \angle 7$



Statement	Justification
Line a is parallel to line b	Given
$\angle 2 \cong \angle 3$	vertical angles
$\angle 3 \cong \angle 7$ are corresponding angles	Definition of corresponding angles
$\angle 2 \cong \angle 7$	Corresponding angles of parallel lines are congruent
$\angle 2 \cong \angle 7$	

- ~~A. Supplementary angles; Reflexive property~~
- B. Vertical angles; ~~Reflexive property~~ *No reflexive property used here!*
- C. Vertical angles; Transitive property**
- ~~D. Supplementary angles; Transitive property~~

**C** 16. Find the value of x if  $m \parallel l$ ,  $m\angle 1 = 4x + 43$ , and  $m\angle 5 = 6x + 29$ . (Note: The diagram is not to scale.)

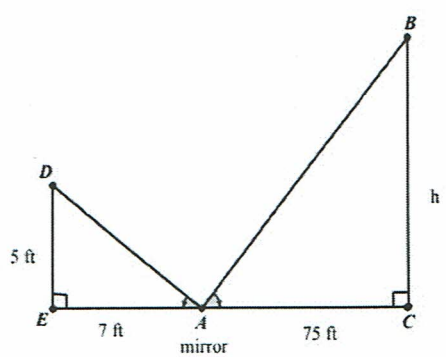


$4x + 43 = 6x + 29$

- A. 8
- B. -7
- C. 7**
- D. 6

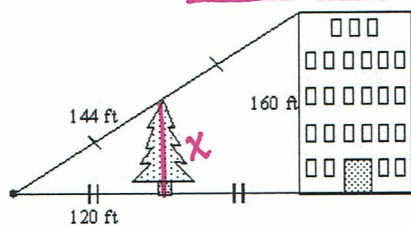
**A** 17. You want to know the approximate height of an indoor rock climbing wall. You place a mirror on the ground and stand where you can see the top of the wall in the mirror, as shown in the diagram. How tall is the wall? Round your answer to the nearest whole number.

- A. 54 ft**
- B. 105 ft
- C. 73 ft
- D. 150 ft



$\frac{75}{7} = \frac{h}{5}$   
 $7h = 375$   
 $h = 53.6$

- A 18. Use the information in the diagram to determine the height of the tree to the nearest foot.



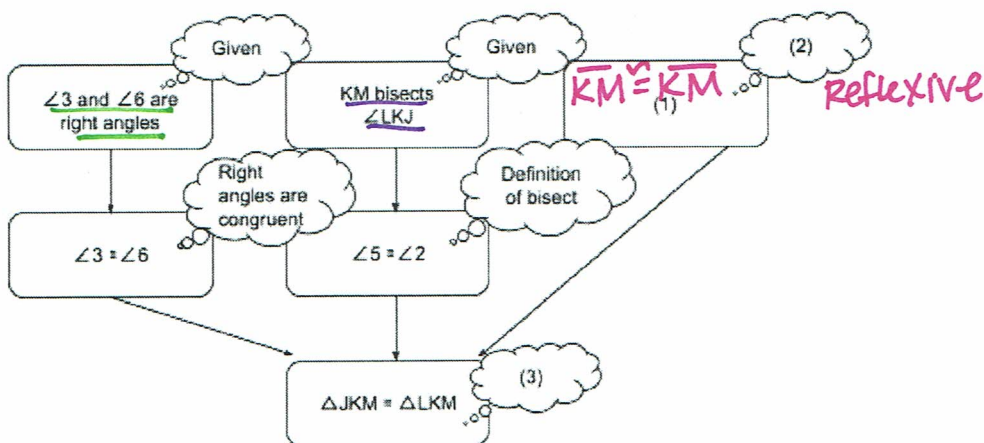
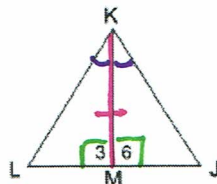
Midsegment Theorem  
 $x \cdot 2 = 160$

- A. 80 ft      B. 264 ft      C. 60 ft      D. 72 ft

- D 19. Complete the proof below using the diagram given.

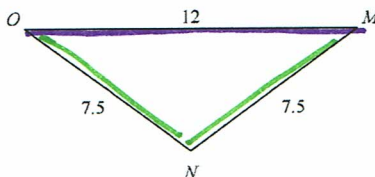
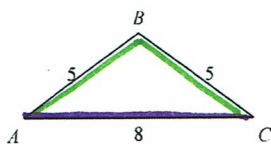
Given:  $\angle 3$  and  $\angle 6$  are right angles,  $\overline{KM}$  bisects  $\angle LKJ$

Prove:  $\triangle LKM \cong \triangle JKM$



- A. ~~(1)  $\angle 1 \cong \angle 4$ , (2) Transitive Property, (3) AAA~~  
 B. (1)  $\overline{KM} \cong \overline{KM}$ , (2) Reflexive Property, (3) SAS  
 C. ~~(1)  $\overline{JM} \cong \overline{LM}$ , (2) Definition of Midpoint, (3) AAS~~  
 D. (1)  $\overline{KM} \cong \overline{KM}$ , (2) Reflexive Property, (3) ASA

- A 20. Determine whether the following triangles are similar. If so, write a similarity statement and then state the correct similarity postulate.



$\frac{12}{8} = \frac{3}{2}$  ✓  
 $\frac{7.5}{5} = \frac{15}{10} = \frac{3}{2}$  ✓

- A.  $\triangle ABC \sim \triangle MNO$ ; SSS  
 B.  $\triangle ABC \sim \triangle MNO$ ; SAS  
 C.  $\triangle ABC \sim \triangle MNO$ ; AA  
 D. The triangles are not similar.

Scale factors are equal