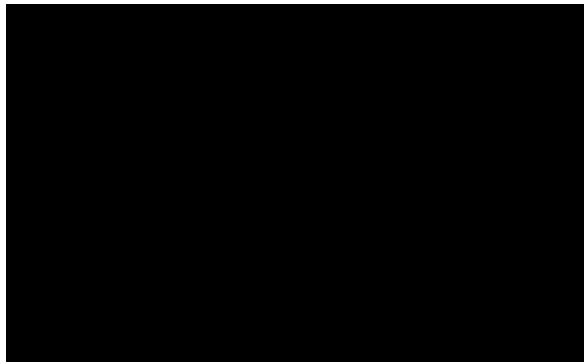


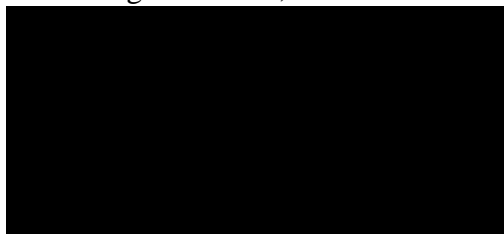
1. In the diagram of  $ABC$  below,  $DE$  is parallel to  $AC$ ,  $CD = 15$ ,  $AD = 9$ , and  $AB = 40$ .



The length of  $DE$  is

- (1) 25              (2) 30              (3) 15              (4) 24

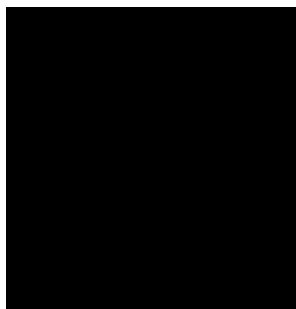
2. In the diagram below,  $AD$  intersects  $BC$  at  $C$ , and



If  $CD = 6.6$  cm,  $DE = 3.4$  cm,  $CE = 4.2$  cm, and  $BC = 5.25$  cm, what is the length of  $AC$ , to the nearest hundredth of a centimeter?

- (1) 5.28              (2) 8.25              (3) 3.34              (4) 2.70

3. Given  $MRO$  shown below, with trapezoid  $PTRO$ ,  $MR = 9$ ,  $MP = 2$ , and  $PO = 4$ .



What is the length of  $PT$ ?

- (1) 5              (2) 4.5              (3) 3              (4) 6

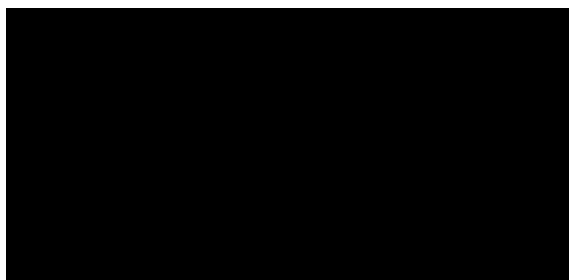
4. As shown in the diagram below,      and      intersect at  $E$ , and      .



Given      , which equation is true?

- (1)      (2)      (3)      **(4)**

5. In the diagram below,



Which measurements are justified by this similarity?

- (1)  $AD = 3$ ,  $AB = 9$ ,  $AE = 5$ , and  $AC = 10$   
**(2)  $AD = 2$ ,  $AB = 6$ ,  $AE = 5$ , and  $AC = 15$**   
(3)  $AD = 5$ ,  $AB = 8$ ,  $AE = 7$ , and  $AC = 10$   
(4)  $AD = 3$ ,  $AB = 6$ ,  $AE = 4$ , and  $AC = 12$

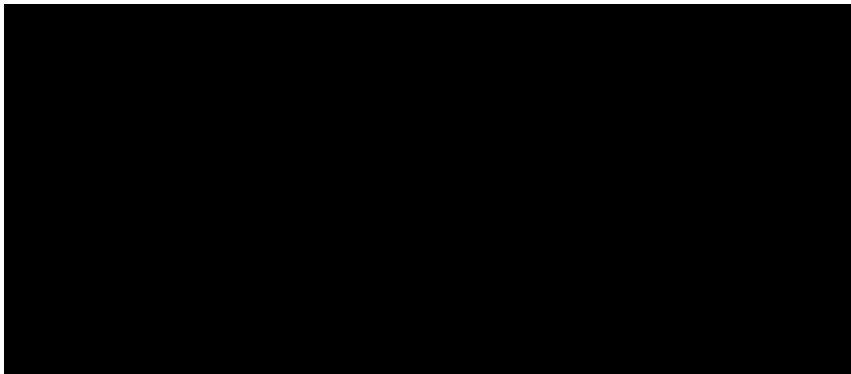
6. A 20-foot support post leans against a wall, making a  $70^\circ$  angle with the ground. To the *nearest tenth of a foot*, how far up the wall will the support post reach?

- (1) 18.7      **(2) 18.8**      (3) 6.9      (4) 68

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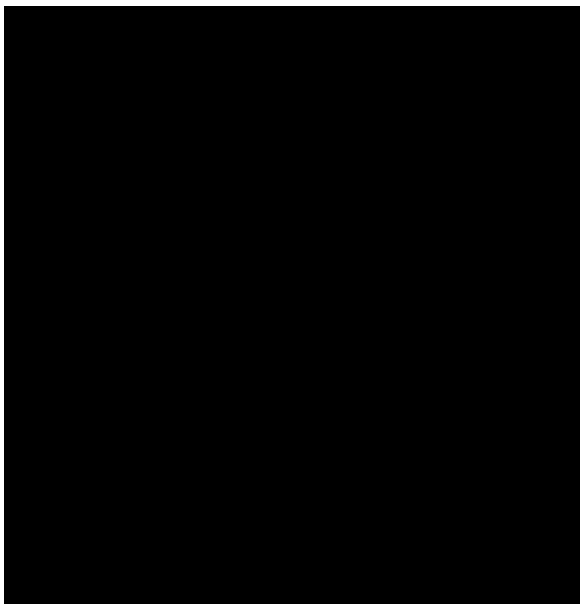
7. In the diagram shown below,  $\overline{AC}$  is tangent to circle  $O$  at  $A$  and to circle  $P$  at  $C$ , intersects  $\overline{OB}$  at  $B$ ,  $OA = 4$ ,  $AB = 5$ , and  $PC = 10$ .



What is the length of  $AC$ ?

- (1) 6.4      (2) 8      (3) 12.5      (4) 16

8. In the diagram below of  $\triangle ABC$ ,  $\angle A = 100^\circ$ ,  $\angle B = 40^\circ$ , and  $\angle C = 40^\circ$ .



What is the value of  $x$ ?

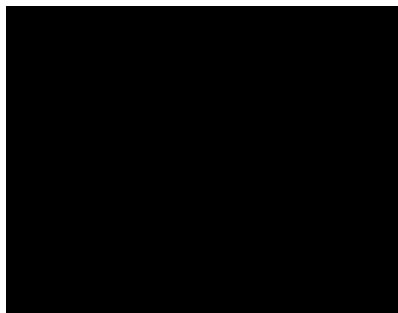
- (1) 2      (2) 5.5      (3) 0.5      (4) 6

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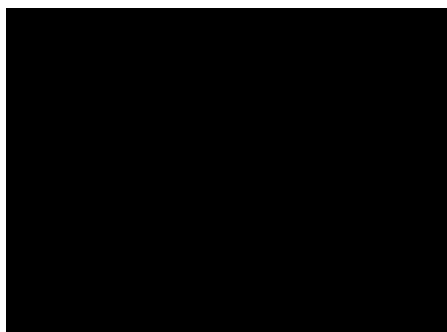
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9. Given the right triangle in the diagram below, what is the value of  $x$ , to the nearest foot?



- (1) 18      (2) 22      (3) 11      (4) 17

10. In scalene triangle  $ABC$  shown in the diagram below, .



Which equation is always true?

- (1)  $x + y = z$       (2)  $x + y + z = 180$   
(3)  $x + y = 180$       (4)  $x + z = 180$

11. Which equation represents a line that is perpendicular to the line represented by  $y = 2x + 3$ ?

- (1)  $y = 2x + 3$       (2)  $y = -\frac{1}{2}x + 3$   
(3)  $y = 2x - 3$       (4)  $y = -\frac{1}{2}x - 3$

12. What is an equation of the line with y-intercept -15 and is perpendicular to the line whose equation is  $y = 3x + 4$ ?

- (1)  $y = 3x - 15$       (2)  $y = -\frac{1}{3}x - 15$   
(3)  $y = 3x + 15$       (4)  $y = -\frac{1}{3}x + 15$

13. As shown in the diagram below, the angle of elevation from a point on the ground to the top of the tree is \_\_\_\_\_.



If the point is 20 feet from the base of the tree, what is the height of the tree, to the *nearest tenth of a foot*?

- (1) 29.7            (2) 16.6            **(3) 13.5**            (4) 11.2

14. Which equation represents a line that is perpendicular to the line whose equation is  $3x - 2y = 7$ ?

- (1)
  - (2)
  - (3)**
  - (4)

15. What is the slope of a line parallel to the line whose equation is  $2y = -6x + 8$ ?

- (1)  $\frac{1}{3}$
- (2)  $-3$
- (3)  $\frac{1}{6}$
- (4)  $-6$

16. What is an equation of the line with y-intercept 6 and is parallel to the line whose equation is  $y = x - 4$ ?

- (1)  $y = x +$   
 (3)  $y = x + \mathbf{6}$

17. The lines  $3y - 6x = 4$  and  $2y = x - 9$  are

- (1) the same line
- (2) neither parallel nor perpendicular**
- (3) parallel
- (4) perpendicular

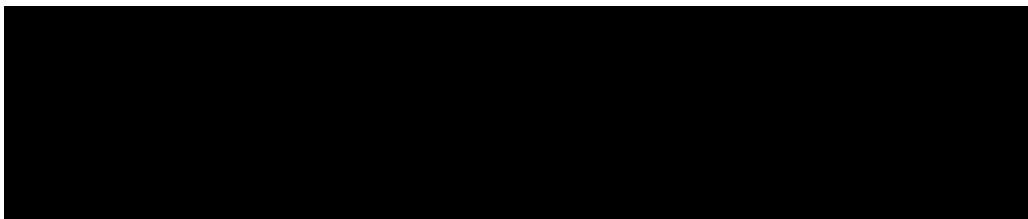
18. The graphs of the lines represented by the equations \_\_\_\_\_ and \_\_\_\_\_ are

- (1) horizontal
- (2) parallel
- (3) perpendicular
- (4) intersecting, but not perpendicular**

19. When writing a geometric proof, which angle relationship could be used alone to justify that two angles are congruent?

- (1) vertical angle**
- (2) supplementary angles
- (3) linear pair of angles
- (4) adjacent angles

20. In the accompanying diagram, line  $a$  intersects line  $b$ .



What is the value of  $x$ ?

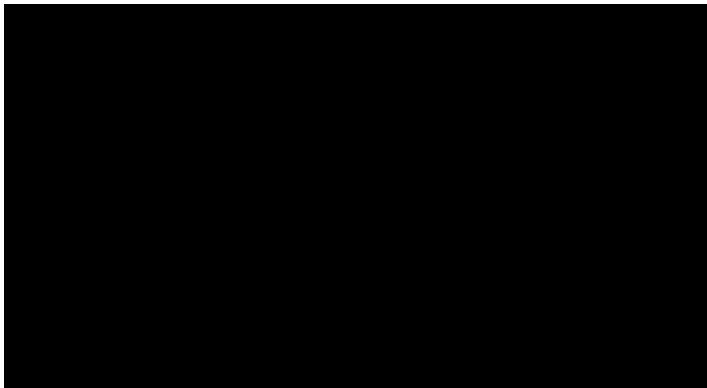
- (1) 90
- (2) -10
- (3) 5
- (4) 10**

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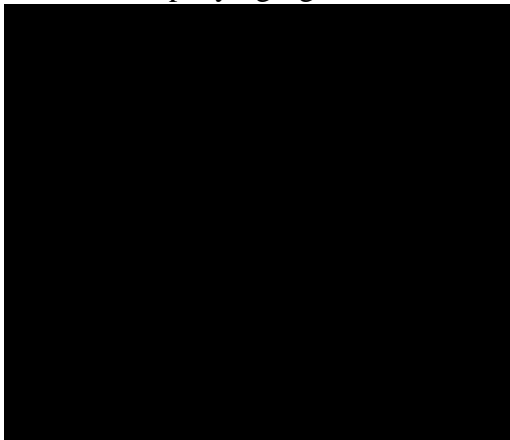
21. In the diagram below, and are shown with  $m$  and



What is  $m$  ?

- (1) 125      (2) **115**      (3) 65      (4) 55

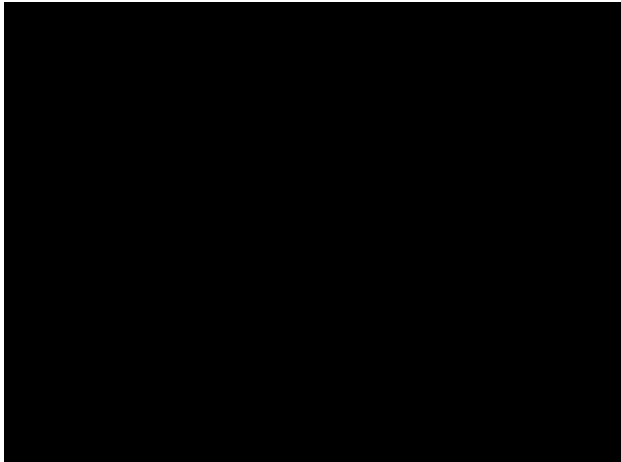
22. In the accompanying figure, , , and .



What is the value of ?

- (1) 75      (2) 105      (3) 150      (4) **180**

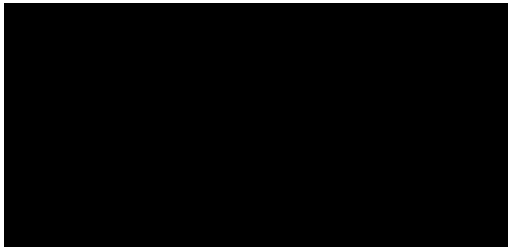
23. In the accompanying figure,



Which equation shows how to calculate the value of ?

- |     |     |
|-----|-----|
| (1) | (2) |
| (3) | (4) |

24. As shown in the diagram below of , is extended through  $D$ ,  
 , and .



Which statement is true?

- (1)  $AB > BC$    (2)  $BC < AC$    (3)  $AC < AB$    (4)  $AC > AB$



