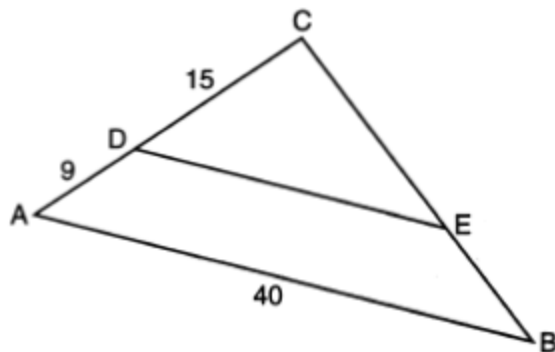
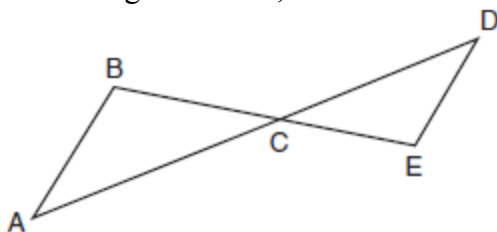


1. In the diagram of $\triangle ABC$ below, \overline{DE} is parallel to \overline{AB} , $CD = 15$, $AD = 9$, and $AB = 40$.



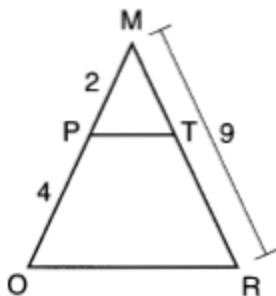
The length of \overline{DE} is

- (1) 25 (2) 24 (3) 15 (4) 30
2. In the diagram below, \overline{AD} intersects \overline{BE} at C , and $\overline{AB} \parallel \overline{DE}$



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

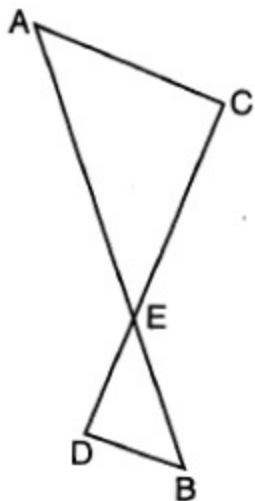
- (1) 8.25 (2) 5.28 (3) 3.34 (4) 2.70
3. Given $\triangle MRO$ shown below, with trapezoid $PTRO$, $MR = 9$, $MP = 2$, and $PO = 4$.



What is the length of \overline{TR} ?

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

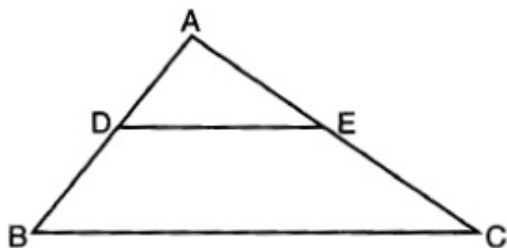
4. As shown in the diagram below, \overline{AB} and \overline{CD} intersect at E , and $\overline{AC} \parallel \overline{BD}$.



Given $\triangle AEC \sim \triangle BED$, which equation is true?

- (1) $\frac{AE}{BE} = \frac{AC}{BD}$ (2) $\frac{CE}{DE} = \frac{EB}{EA}$ (3) $\frac{ED}{EC} = \frac{AC}{BD}$ (4) $\frac{EC}{AE} = \frac{BE}{ED}$

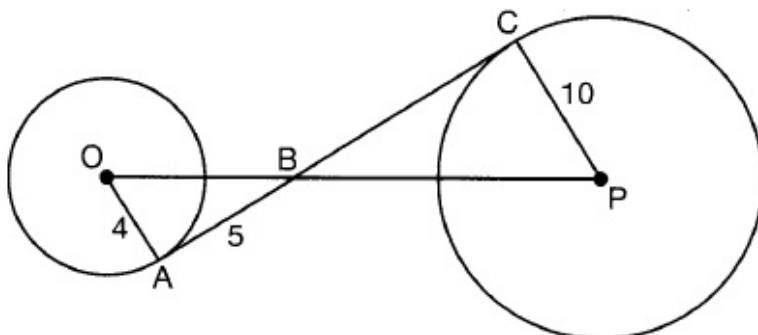
5. In the diagram below, $\triangle ABC \sim \triangle ADE$



Which measurements are justified by this similarity?

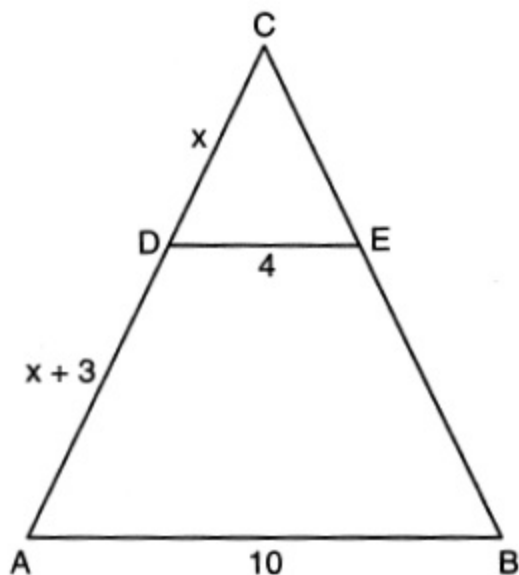
- (1) $AD = 2$, $AB = 6$, $AE = 5$, and $AC = 15$
 (2) $AD = 3$, $AB = 9$, $AE = 5$, and $AC = 10$
 (3) $AD = 3$, $AB = 6$, $AE = 4$, and $AC = 12$
 (4) $AD = 5$, $AB = 8$, $AE = 7$, and $AC = 10$
6. A 20-foot support post leans against a wall, making a 70° angle with the ground. To the *nearest tenth of a foot*, how far up the wall will the support post reach?
- (1) 18.7 (2) 18.8 (3) 6.9 (4) 68

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



What is the length of \overline{BC} ?

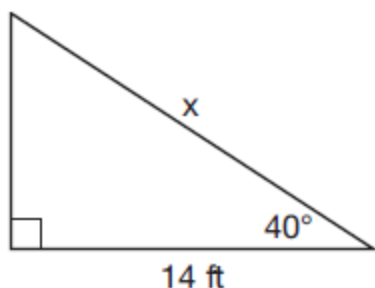
- (1) 6.4 (2) 8 (3) 12.5 (4) 16
8. In the diagram below of $\triangle ABC$, \overline{CDA} , \overline{CEB} , $\overline{DE} \parallel \overline{AB}$, $DE = 4$, $AB = 10$, $CD = x$, and $DA = x + 3$.



What is the value of x ?

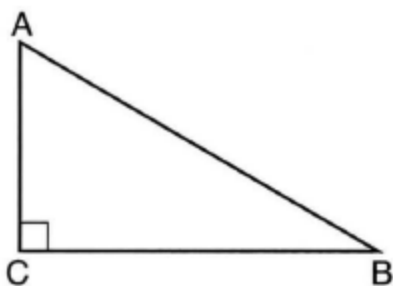
- (1) 6 (2) 2 (3) 0.5 (4) 5.5

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



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

10. In scalene triangle ABC shown in the diagram below, $m\angle C = 90^\circ$.



Which equation is always true?

- (1) $\cos A = \cos B$ (2) $\cos A = \sin C$
(3) $\sin A = \cos B$ (4) $\sin A = \sin B$

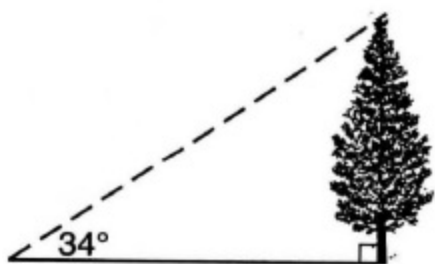
11. Which equation represents a line that is perpendicular to the line represented by $y = \frac{2}{3}x + 1$?

- (1) $y = \frac{3}{2}x + 2$ (2) $3x - 2y = 12$
(3) $y = -\frac{2}{3}x + 4$ (4) $3x + 2y = 12$

12. What is an equation of the line with y-intercept -15 and is perpendicular to the line whose equation is $y = \frac{1}{3}x + 6$?

- (1) $y = -3x - 15$ (2) $y = \frac{1}{3}x - 13$
(3) $y = \frac{1}{3}x + 15$ (4) $y = -3x + 27$

13. As shown in the diagram below, the angle of elevation from a point on the ground to the top of the tree is 34° .



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) $y = \frac{3}{2}x - 5$ (2) $y = -\frac{2}{3}x + 4$
(3) $y = -\frac{3}{2}x + 5$ (4) $y = \frac{2}{3}x - 4$

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

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

16. What is an equation of the line with y-intercept 6 and is parallel to the line whose equation is $y = \frac{3}{2}x - 4$?

- (1) $y = \frac{-2}{3}x$ (2) $y = \frac{3}{2}x$
(3) $y = \frac{-2}{3}x + \frac{5}{3}$ (4) $y = \frac{3}{2}x + 6$

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

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

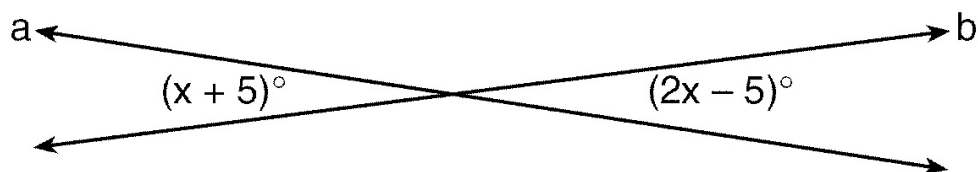
18. The graphs of the lines represented by the equations $y = \frac{1}{3}x + 7$ and $y = -\frac{1}{3}x - 2$ are

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

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

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

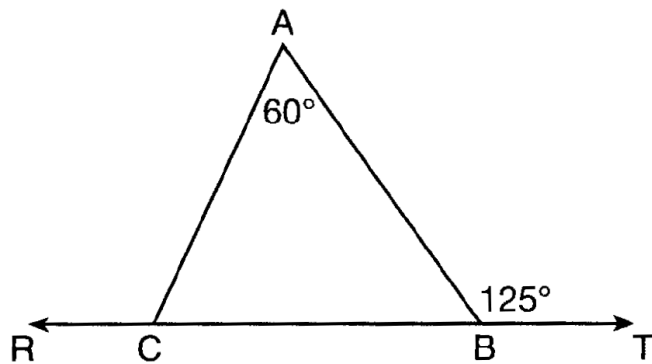
20. In the accompanying diagram, line a intersects line b .



What is the value of x ?

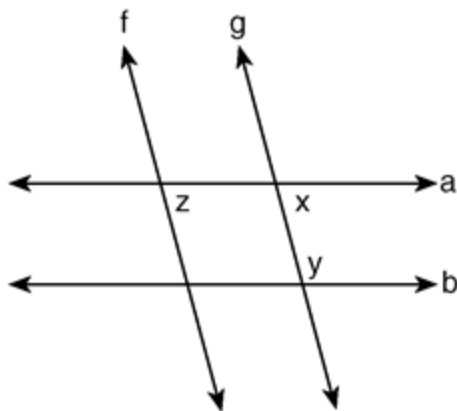
- (1) 5
- (2) 10
- (3) -10
- (4) 90

21. In the diagram below, \overline{RCBT} and $\triangle ABC$ are shown with $m\angle A = 60$ and $m\angle ABT = 125$.



What is $m\angle ACR$?

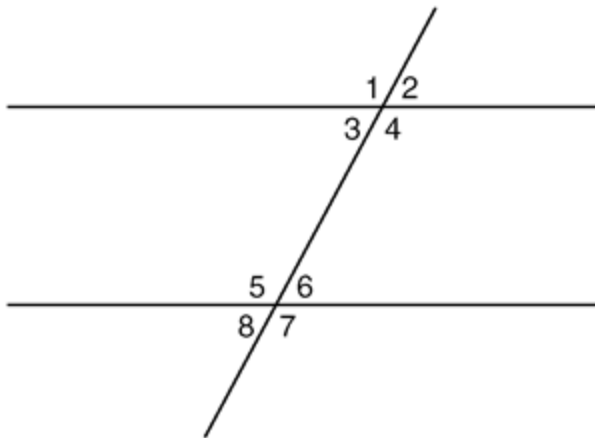
- (1) 125 (2) 115 (3) 65 (4) 55
22. In the accompanying figure, $a \parallel b$, $f \parallel g$, and $m\angle x = 75$.



What is the value of $m\angle y + m\angle z$?

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

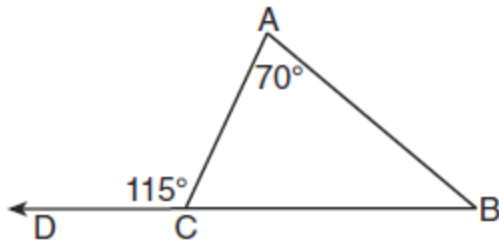
23. In the accompanying figure, $\angle 1 = (60 + x)^\circ$



Which equation shows how to calculate the value of $\angle 6$?

- | | |
|----------------------------|----------------------------|
| (1) $180 + (60 + x)^\circ$ | (2) $(60 + x)^\circ - 180$ |
| (3) $180 - (60 + x)^\circ$ | (4) $(60 + x)^\circ + 180$ |

24. As shown in the diagram below of $\triangle ABC$, \overline{BC} is extended through D , $m\angle A = 70$, and $m\angle ACD = 115$.



Which statement is true?

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