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

[redacted]

The length of is

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

2. In the diagram below, intersects at *C*, and

[redacted]

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

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

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

[redacted]

What is the length of ?

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

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

[redacted]

Given , which equation is true?

(1) (2) (3) (4)

5. In the diagram below,

[redacted]

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, is tangent to circle O at A and to circle Pat C, intersects at B, OA = 4, AB = 5, and PC =10.

[redacted]

What is the length of ?

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

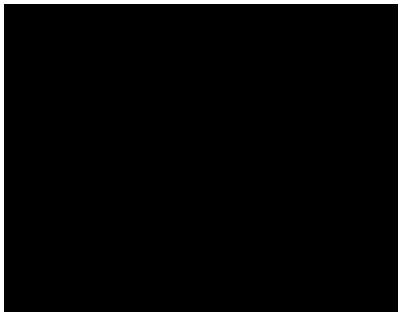
8. In the diagram below of , , .

[redacted]

What is the value of x?

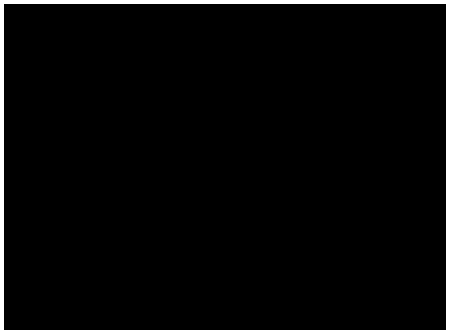
(1) 6 (2) 2 (3) 0.5 (4) 5.5

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, .



Which equation is always true?

(1) (2)
(3) (4)

11. Which equation represents a line that is perpendicular to the line represented by ?

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

12. What is an equation of the line with y-intercept -15 and is perpendicular to the line whose equation is ?

(1) (2)
(3) (4)

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) $\mathbf{\frac{1}{3}}$
(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 $y = x - 4$?

(1) $y = x$ (2) $y = x$
(3) $y = x +$ **(4)** $\boldsymbol{y = x + 6}$

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 and 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.

[redacted]

What is the value of x?

(1) 5 **(2) 10** (3) –10 (4) 90

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

[redacted]

What is m ?

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

22. In the accompanying figure, , , *and* .

[redacted]

What is the value of ?

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

23. In the accompanying figure,

[redacted]

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 .

[redacted]

Which statement is true?

(1) $\boldsymbol{AC < AB}$ (2) $AB > BC$ (3) $AC > AB$ (4) $BC < AC$