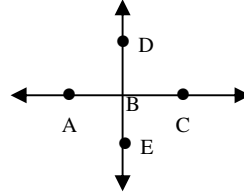ACT Geometry Review Problems

Choose the correct answer.
NOTE: Figures are not drawn to scale.

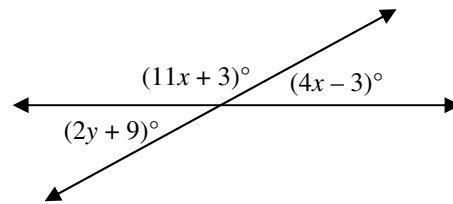1. In the figure, $AC = 24$, $AB = 6x - 6$, $BC = 5x - 3$ and $BE = 3x + 2$. Which do you know is true?

    I. $\overline{AC}$ bisects $\overline{DE}$.

    II. $\overline{DE}$ bisects $\overline{AC}$.

    III. $\overleftrightarrow{DE}$ bisects $\overleftrightarrow{AC}$.

    a) I only   b) II only   c) III only   d) I and II only   e) II and III only

2. Find the values of x and y.

    a) $x = 20$, $y = 34$ b) $x = 10$, $y = 52$

    c) $x = 12$, $y = 18$ d) $x = 11$, $y = 7$

    $(11x + 3)°$ $(4x - 3)°$
    $(2y + 9)°$

3. In the figure, $\overrightarrow{BD}$ bisects $\angle ABE$, $\overrightarrow{BE}$ bisects $\angle ABG$, $m\angle EBF = 37$, and $m\angle CBG = 44$.
    Find $m\angle DBF$.

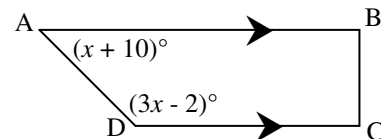   a) 68   b) 34   c) 82   d) 71
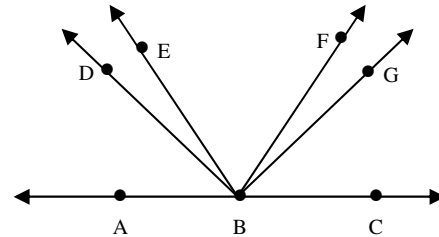
4. $\angle ABC$ and $\angle CBD$ are adjacent congruent angles, and $m\angle ABD = 160$. What are the two possible
    measures for $\angle ABC$?

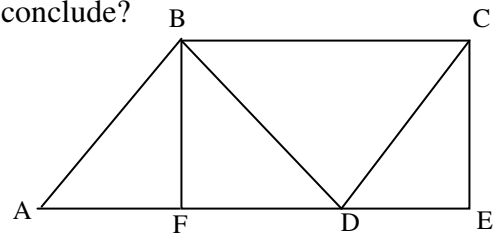   a) 80, 160   b) 100, 160   c) 80, 100   d) 90, 180   e) 160, 200

5. Find $m\angle ADC$.

    a) 53   b) 43   c) 137   d) 127

    $(x + 10)°$
    $(3x - 2)°$

6. If $\overline{AB} \parallel \overline{CD}$, AB = CD and AF = FD = DE. What can you conclude?

I. $\triangle ABF \cong \triangle DCE$

II. $\triangle ABF \cong \triangle DBF$

III. $\triangle DBF \cong \triangle DCE$

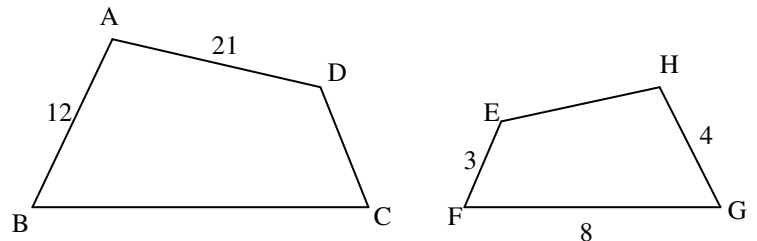a) I only   b) II only   c) III only   d) I, II and III

7. The ratio of the measures of two supplementary angles 7:8. Which proportion(s) could you use to find the measures of the angles?

I. $\dfrac{x}{y} = \dfrac{7}{8}$ II. $\dfrac{x}{y} = \dfrac{8}{7}$ III. $\dfrac{x}{180 - x} = \dfrac{7}{8}$ IV. $\dfrac{x}{180 - x} = \dfrac{8}{7}$

a) I only   b) II only   c) I and II only   d) III and IV only   e) I, II III, and IV

8. Quad. ABCD ~ Quad. HGFE. Find the perimeter of ABCD.
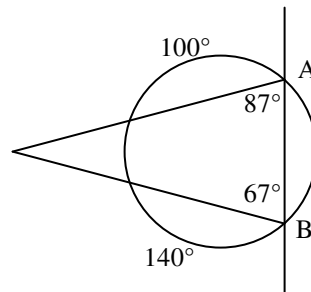
a) 88   b) 22   c) 66   d) 31

9. A ladder 6 m long just reaches the top of a building and its foot makes a 76° angle with the ground. Which of the following equations could be used to calculate the height, h, of the building?

I. $\sin 76° = \dfrac{h}{6}$ II. $6 \cdot \cos 14° = h$ III. $\cos 76° = \dfrac{h}{6}$

a) I only   b) II only   c) III only   d) I and II only   e) I, II and III

10. Find the measure of $\overset{\frown}{AB}$.

a) 34   b) 26   c) 86   d) 76

11. A square garden enclosed by a fence with perimeter 40 m is to be expanded so it includes 300 m² more area but is still square. If the gardener can reuse the old fence pieces, what length of new fence must the gardener buy?

a) 10 m   b) 20 m   c) 40 m   d) 100 m

12. A rectangular garden has dimensions 30 feet by 20 feet. What is the area of the 2 foot wide walkway around the garden?
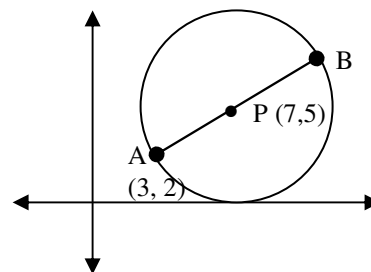
    a) 104 ft^2 b) 216 ft^2 c) 680 ft^2 d) 704 ft^2 e) 1416 ft^2

13. In two hours, the minute hand of a clock rotates through an angle equal to which of the following?

    a) 90   b) 180   c) 360   d) 720   e) 1080

14. $\overline{AB}$ is the diameter of a circle whose center is at P. What are the coordinates of B?

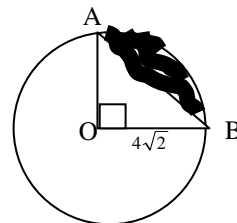   a) (10, 7)   b) (5, 2.5)   c) (12, 7)   d) (11, 8)   e) (11, 7)

15. In ΔABC, $m\angle A = 23$ and $m\angle B = 84$. What is the longest side of ΔABC?

    a) $\overline{AC}$ b) $\overline{AB}$ c) $\overline{BC}$ d) $\overline{AC} \cong \overline{AB}$ (there is no longest side)
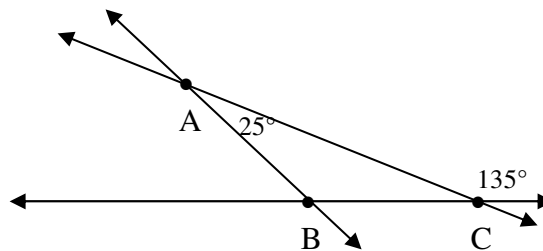
16. Given that $m\angle OAB = 45°$. What is the area of the shaded portion of the circle?

    a) $32\pi - 16\sqrt{2}$ b) 4π - 8   c) 32π - 8

    d) 8π - 16   e) 8π - 8

17. What is the degree measure of ∠ABC?

    a) 45°   b) 100°   c) 110°

    d) 135°   e) 160°

18. A 65-foot ladder is leaning against a wall. Its lower end is 25 feet away from the wall. How much farther away will it be if the upper end is moved down 8 feet?

   a) 39 ft   b) 52 ft   c) 14 ft   d) 10 ft   e) 8 ft

19. If point R has coordinates (x, y) and point S has coordinates $(x + 1, y + 1)$, what is the distance between R and S?

a) $\sqrt{2}$ b) $\sqrt{x^2 + y^2}$ c) 2   d) $\sqrt{x^2 + y^2 + 2}$ e) $x + y + 1$

20. Will is standing 40 yards due North of point P. Grace is standing 60 yards due West of point P. What is the shortest distance between Will and Grace?

a) 20 yds   b) $20\sqrt{13}$ yds   c) $80\sqrt{13}$ yds   d) $4\sqrt{13}$ yds   e) 80 yds

21. The circle in the figure is inscribed in a square with a perimeter of 20 inches. What is the area of the shaded regions?
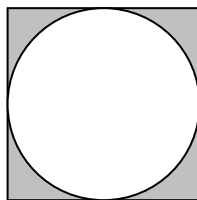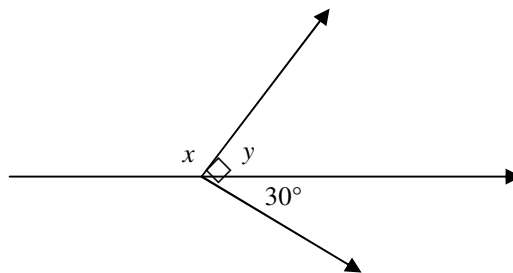

22. A trapezoidal flower garden is shown below. What is the area of the garden?
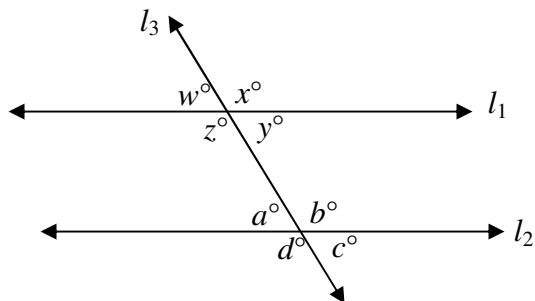

10 m

9 m

13 m
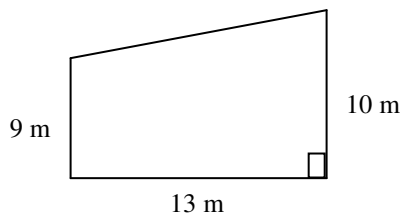
23. In the figure below, $x = $?

a) 45   b) 60   c) 90   d) 105   e) 120

x y

30°

24. In the figure below, l_1 is parallel to l_2. Which of the following must be true?

I. $w = a$

II. $y + b = 180°$

III. $x + d = 180°$

a) I only   b) II only   c) I and II only

d) II and III only   e) I, II and III

l_3

$w°$ $x°$ l_1

$z°$ $y°$

$a°$ $b°$ l_2

$d°$ $c°$

Use the picture of ΔABC to answer questions 25 – 28.

25. In the figure, AB = ?

    a) 2   b) $2\sqrt{3}$ c) 4   d) $4\sqrt{2}$ e) 8

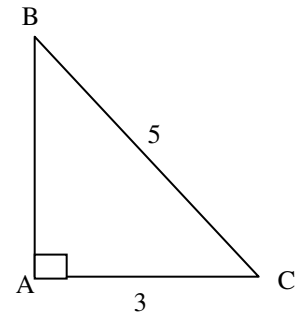26. What is the ratio for sinB.

    a) $\dfrac{3}{5}$ b) $\dfrac{4}{5}$ c) 45°   d) $\dfrac{\sqrt{34}}{5}$ e) $\dfrac{3}{\sqrt{34}}$

27. What is the ratio for tanC?

    a) $\dfrac{3}{4}$ b) $\dfrac{5}{3}$ c) $\dfrac{4}{3}$ d) $\dfrac{\sqrt{34}}{3}$ e) $\dfrac{3}{\sqrt{34}}$
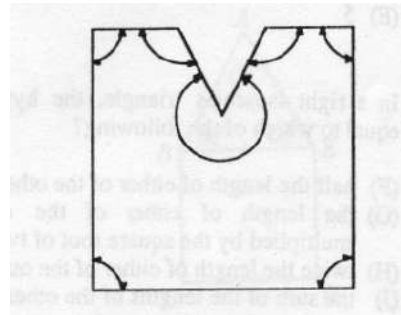
28. Find the measure of ∠B.

    a) 90   b) 36.9   c) 53.1   d) 30.9   e) 45

─ ─

29. In the figure, what is the sum of the indicated angles?

    a) 540

    b) 720

    c) 900

    d) 1,080

    e) 1,260
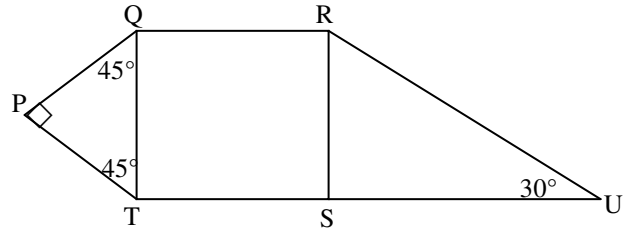

30. If the area of a circle is 9π, which of the following is(are) true?

    I.   The radius is 3.

    II. The diameter is 6.

    III. The circumference is 6π.

    a) I only   b) II only   c) III only   d) I and II only   e) I, II and III
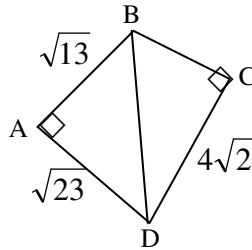
31. In the figure, if QRST is a square and $PQ = \sqrt{2}$, what is the length of RU?

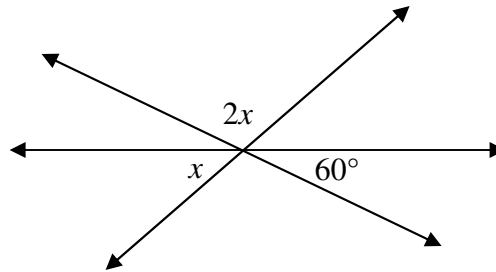   a) $\sqrt{2}$ b) $\sqrt{6}$ c) $2\sqrt{2}$

    d) 4   e) $4\sqrt{3}$

32. Use the figure to find the length of BC.

    a) 1   b) 2   c) 3

    d) 4   e) 5

33. What is $2x - 60$ equal to?
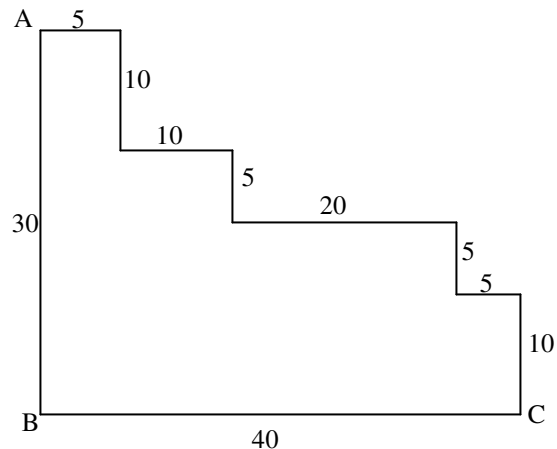
    a) 80   b) 40   c) 30

    d) 20   e) 10

34. A triangle has sides with lengths 12, 14 and 20 is similar to a 2nd triangle that has 1 side with length of 40. What is the smallest possible perimeter of the 2nd triangle?

    a) 48   b) 92   c) 120   d) 160   e) 180

35. In the figure below, all distances are in centimeters and all angles are right angles. What is the length, in centimeters, of segment AC?

    a) $30\sqrt{2}$ b) 50   c) 75

    d) $60\sqrt{2}$ e) 100

ACT Geometry Review Answers:

1) B   not enough info to tell BD≅BD be sure, never assume!
2) C   linear pair
3) D   straight line = 180
4) C   160 /2 and 360-160 then /2
5) D   Same Side Interior angles (only if parallel lines! Look for arrows)
6) A   Mark ≅ sides with tick marks. Look for corresponding angles.
7) D   7x + 8x = 180
8) C   ratio is 12:4
9) D   SOHCAHTOA
10) C   inscribed angles
11) C   add old and new area and find the sides.
12) B   outside area minus inside area
13) D   minute hand goes around the full circle twice
14) D   midpoint formula
15) A   longest side is across from the largest angle
16) D   ¼ area of the circle minus the area of the triangle
17) C   remote interior angle theorem or linear pair & add 2 ∠s then
        subtract from 180
18) C   Pythagorean theorem (make sure you subtract!)
19) A   distance formula
20) B   Pythagorean theorem
21) 25-6.25π (or 5.37)
22) 123.5 m^2
23) E   Right angle = 90 and linear pair
24) C   Alternate Interior, Corresponding, Alternate Exterior, Same Side Interior
25) C   Pythagorean theorem
26) A   SOHCAHTOA
27) C   SOHCAHTOA
28) B   SOHCAHTOA (press 2nd on your calculator. Calculator in degree mode.)
29) C   (n-2)180 (sum of the interior angles)
30) E   Area of circle = πr^2, Circumference = 2πr
31) D   45-45-90 and 30-60-90 triangles
32) B   Pythagorean theorem
33) D   straight line = 180 and vertical angles are ≅. Plug x in to 2x−60
34) B   40 ~ 20 so each side is twice as big
35) B   Pythagorean theorem