

1. Solve for the value of x.

- A) 5
- B) 6
- C) 8
- D) 10

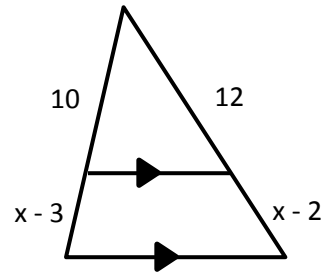
$$\frac{10}{x-3} = \frac{12}{x-2}$$

$$10(x-2) = 12(x-3)$$

$$10x - 20 = 12x - 36$$

$$16 = 2x$$

$$8 = x$$



2. Solve for the value of x.

- A) 0.8
- B) 6
- C) 8
- D) 10

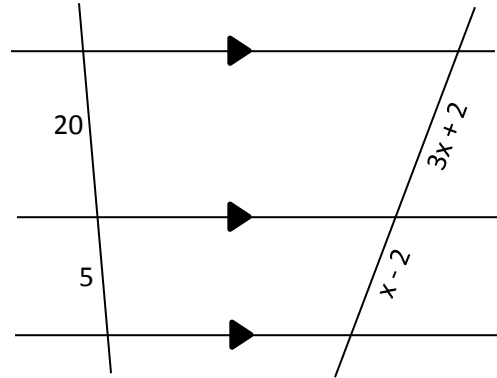
$$\frac{20}{5} = \frac{3x+2}{x-2}$$

$$20(x-2) = 5(3x+2)$$

$$20x - 40 = 15x + 10$$

$$5x = 50$$

$$x = 10$$



3. Solve for the value of x.

- A) 6
- B) 8
- C) 10
- D) 20

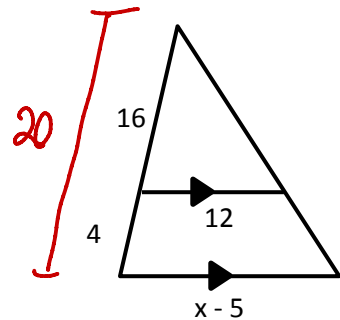
$$\frac{16}{20} = \frac{12}{x-5}$$

$$16(x-5) = 20(12)$$

$$16x - 80 = 240$$

$$16x = 320$$

$$x = 20$$



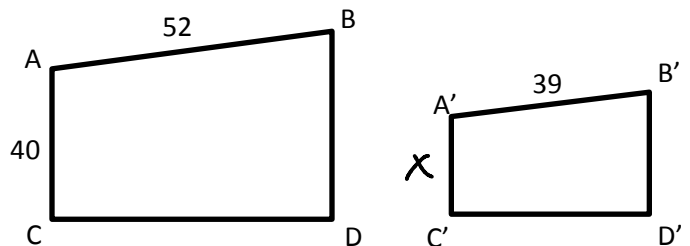
4. Given  $ABCD \sim A'B'C'D'$ . Find the value of x.

- A) 3
- B) 20
- C) 27
- D) 30

$$\frac{52}{39} = \frac{40}{x}$$

$$52x = 1560$$

$$x = 30$$



5. Solve for the value of x.

- A) 6
- B) 8
- C) 13
- D) -14

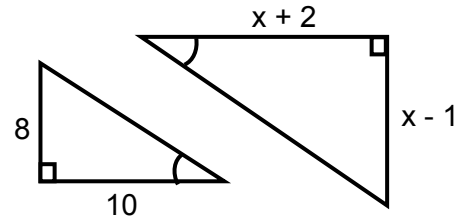
$$\frac{8}{x-1} = \frac{10}{x+2}$$

$$8(x+2) = 10(x-1)$$

$$8x+16 = 10x-10$$

$$26 = 2x$$

$$13 = x$$



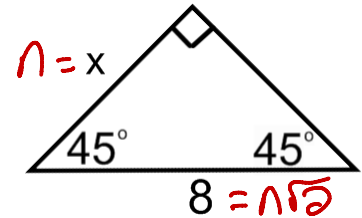
6. Solve for the value of x.

- A) 8
- B)  $8\sqrt{2}$
- C)  $4\sqrt{2}$
- D) 16

$$n\sqrt{2} = 8$$

$$n = \frac{8}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$$

$$n = \frac{8\sqrt{2}}{2} = 4\sqrt{2} \rightarrow x = 4\sqrt{2}$$



7. Find x and BD.

- A)  $x = 2$ ;  $BD = 14$
- B)  $x = 4$ ;  $BD = 16$
- C)  $x = 5$ ;  $BD = 17$
- D)  $x = 3$ ;  $BD = 15$

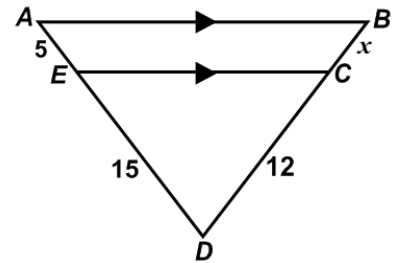
$$\frac{15}{5} = \frac{12}{x}$$

$$15x = 60$$

$$x = 4$$

$$BD = 4 + 12$$

$$BD = 16$$

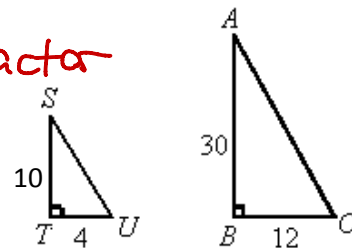


8. Find the ratio of the perimeters of the figures.

- A) 2:15
- B) 1:3
- C) 5:2
- D) 5:6

Ratio of Perimeters = Scale Factor

$$SF = \frac{10}{30} = \frac{1}{3}$$



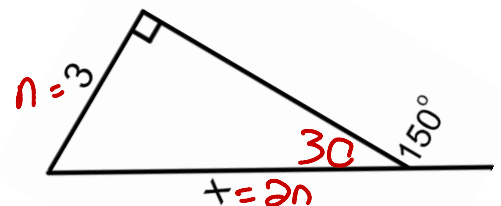
9. Solve for x.

- A) 3
- B)  $3\sqrt{3}$
- C)  $3\sqrt{2}$
- D) 6

$$x = 2n$$

$$x = 2(3)$$

$$x = 6$$



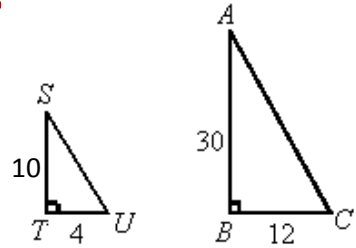
10. Find the ratio of the areas of the figures.

- A) 5:2
- B) 1:3
- C) 1:9
- D) 25:4

Ratio of Areas = (Scale Factor)<sup>2</sup>

$$SF = \frac{10}{30} = \frac{1}{3}$$

Ratio of Areas =  $(\frac{1}{3})^2 = \frac{1}{9}$



11. Solve for the value of x.

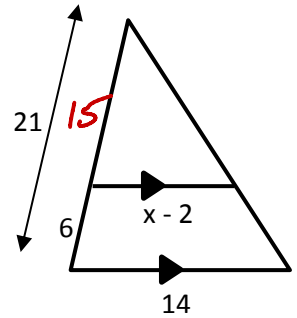
- A) 4
- B) 6
- C) 10
- D) 12

$$\frac{15}{21} = \frac{x-2}{14}$$

$$21(x-2) = 210$$

$$21x - 42 = 210$$

$$21x = 252 \rightarrow x = 12$$



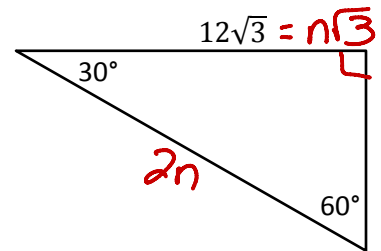
12. Find the length of the hypotenuse.

- A) 12
- B) 24
- C)  $12\sqrt{6}$
- D) 36

$$n\sqrt{3} = 12\sqrt{3}$$

$$n = 12$$

$$2(21) = 24$$

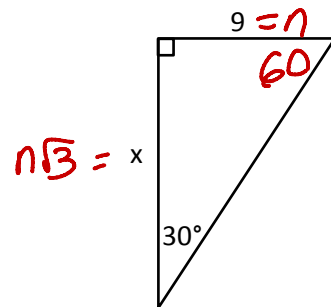


13. Find the value of x.

- A)  $3\sqrt{3}$
- B)  $9\sqrt{2}$
- C)  $9\sqrt{3}$
- D) 18

$$x = n\sqrt{3}$$

$$x = 9\sqrt{3}$$



14. Find the length of the segment with endpoints at (-8, 5) and (4, -3).

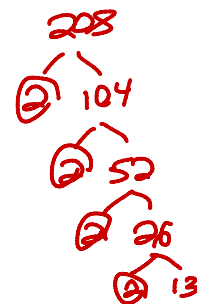
- A)  $2\sqrt{5} \approx 4.5$
- B)  $4\sqrt{13} \approx 14.4$
- C) 20
- D) 208

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(4 - (-8))^2 + (-3 - 5)^2}$$

$$d = \sqrt{12^2 + (-8)^2}$$

$$d = \sqrt{208} = 2 \cdot 2\sqrt{13} = 4\sqrt{13}$$



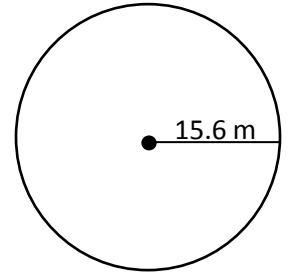
15. Find the approximate circumference of the circle.

- A) 31.2 m
- B) 49.0 m
- C) 98.0 m
- D) 764.5 m

$$C = 2\pi r$$

$$C = 2\pi(15.6)$$

$$C = 98.0 \text{ m}$$



16. If the area of a rhombus is  $60\text{m}^2$  and one diagonal is  $15\text{m}$ , find the other diagonal.

- A) 2 m
- B) 4 m
- C) 105 m
- D) 8 m

$$A = \frac{d_1 \cdot d_2}{2}$$

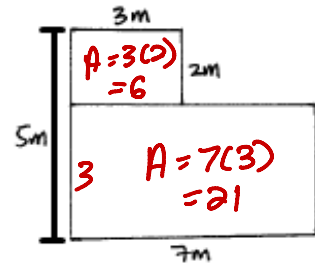
$$2 \cdot 60 = \frac{15d_2}{2} \cdot 2$$

$$120 = 15d_2 \rightarrow d_2 = 8 \text{ m}$$

17. Find the area of the shape.

- A)  $24 \text{ m}^2$
- B)  $27 \text{ m}^2$
- C)  $41 \text{ m}^2$
- D)  $210 \text{ m}^2$

$$6 + 21 = 27 \text{ m}^2$$



18. A circle has a circumference of  $30\pi$ . What is the radius?

- A) 15 ft
- B) 4.77 ft
- C)  $900\pi$  ft
- D) 47.1 ft

$$C = 2\pi r$$

$$\frac{30\pi}{2\pi} = \frac{2\pi r}{2\pi}$$

$$15 = r$$

19. Find the height and perimeter of  $\triangle ABC$ .

- A)  $h = 8$ ; Perimeter = 48
- B)  $h = 22.67$ ; Perimeter = 70.67
- C)  $h = 11.66$ ; Perimeter = 48
- D)  $h = 16.2$ ; Perimeter = 64.2

$$6^2 + h^2 = 10^2$$

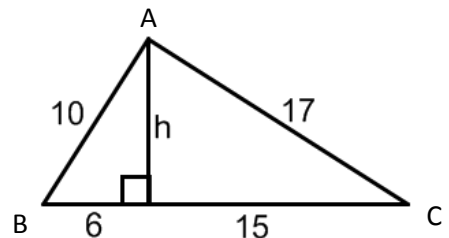
$$36 + h^2 = 100$$

$$h^2 = 64$$

$$h = 8$$

$$P = 10 + 17 + 6 + 15$$

$$= 48$$



20. Find the area of the figure.

- A) 240 in<sup>2</sup>
- B) 130 in<sup>2</sup>
- C) 260 in<sup>2</sup>
- D) 120 in<sup>2</sup>

$$10^2 + b^2 = 26^2$$

$$100 + b^2 = 676$$

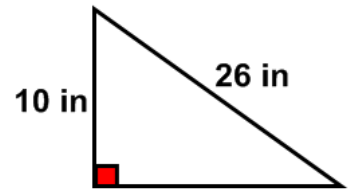
$$b^2 = 576$$

$$b = 24$$

$$A = \frac{bh}{2}$$

$$A = \frac{24(10)}{2}$$

$$A = 120 \text{ in}^2$$



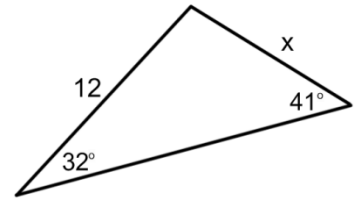
21. Use the Law of Sines to solve for the value of x.

- A) 7.6
- B) 8.1
- C) 9.7
- D) 10.3

$$\frac{\sin 32}{x} = \frac{\sin 41}{12}$$

$$12 \sin 32 = x \sin 41$$

$$\frac{12 \sin 32}{\sin 41} = x \rightarrow x = 9.7$$



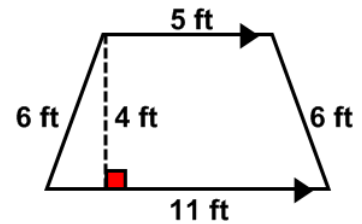
22. Find the area of the figure.

- A) 64 ft<sup>2</sup>
- B) 44 ft<sup>2</sup>
- C) 32 ft<sup>2</sup>
- D) 48 ft<sup>2</sup>

$$A = \frac{h(b_1 + b_2)}{2}$$

$$A = \frac{4(11 + 5)}{2}$$

$$A = 32 \text{ ft}^2$$



23. Find the area of the shaded region.

- A) 452.39 in<sup>2</sup>
- B) 113.1 in<sup>2</sup>
- C) 30.9 in<sup>2</sup>
- D) 144 in<sup>2</sup>

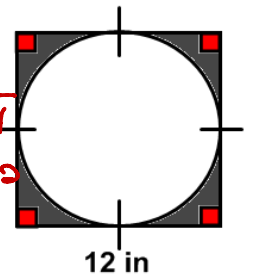
$$A_{\square} = 5^2 \quad A_{\circ} = \pi r^2$$

$$A_{\square} = 12^2 \quad A_{\circ} = \pi (6)^2$$

$$A_{\square} = 144 \quad A_{\circ} = 36\pi$$

$$A_{\text{shaded}} = 144 - 36\pi$$

$$= 30.9 \text{ in}^2$$



24. The area of a rectangle is 243 cm<sup>2</sup>. The length is triple the width. Find the width.

- A) 9 cm
- B) 18 cm
- C) 27 cm
- D) 81 cm

$$A = bh \quad \text{or} \quad A = lw \rightarrow l = 3w$$

$$A = 3w \cdot w$$

$$A = 3w^2$$

$$243 = 3w^2$$

$$81 = w^2$$

$$9 = w$$

25. Find the surface area.

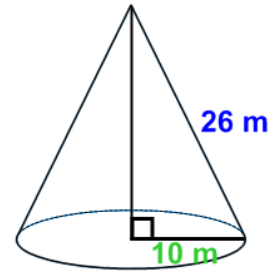
- A) 998.42 m<sup>2</sup>
- B) 1068.14 m<sup>2</sup>
- C) 1130.9 m<sup>2</sup>
- D) 1445.13 m<sup>2</sup>

$$SA = \pi r l + \pi r^2 \quad r = 10$$

$$SA = \pi (10)(26) + \pi (10)^2 \quad l = 26$$

$$= 260\pi + 100\pi$$

$$= 360\pi \approx 1130.973355$$



*rounded incorrectly*

26. Find the height of the cylinder if the radius is 7m and the Surface area is 791.68m<sup>2</sup>.

- A) 2.25 m
- B) 11.0 m
- C) 13 m
- D) 16.16 m

$$SA = 2\pi r h + 2\pi r^2$$

$$791.68 = 2\pi (7)h + 2\pi (7)^2$$

$$791.68 = 14\pi h + 98\pi$$

$$483.8039 = 14\pi h$$

$$11.0 = h$$

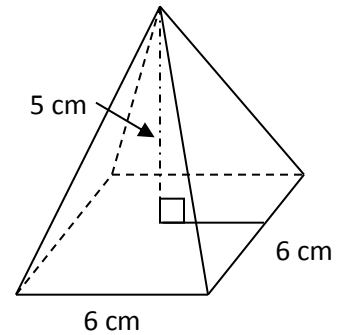
27. Find the volume.

- A) 180 cm<sup>3</sup>
- B) 40 cm<sup>3</sup>
- C) 70 cm<sup>3</sup>
- D) 60 cm<sup>3</sup>

$$V = \frac{Bh}{3} \quad B = 6(6) = 36$$

$$V = \frac{36(5)}{3}$$

$$V = 60 \text{ cm}^3$$



28. Find the volume of a sphere that has a circumference of 31.4 m.

- A) 314.2 m<sup>3</sup>
- B) 130.9 m<sup>3</sup>
- C) 104.7 m<sup>3</sup>
- D) 523.6 m<sup>3</sup>

$$C = 2\pi r \quad V = \frac{4\pi r^3}{3}$$

$$31.4 = 2\pi r \quad V = \frac{4\pi (5)^3}{3}$$

$$5 = r \quad V = 523.6 \text{ m}^3$$

30. Find the volume.

A) 471.24 ft<sup>3</sup>

B) 157.08 ft<sup>3</sup>

C) 204.47 ft<sup>3</sup>

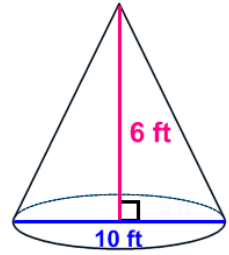
D) 172.79 ft<sup>3</sup>

$$V = \frac{\pi r^2 h}{3}$$

$r = 5$   
 $h = 6$

$$V = \frac{\pi (5)^2 (6)}{3}$$

$$V = 157.08 \text{ ft}^3$$



31. Find the volume.

A) 2094.40 ft<sup>3</sup>

B) 5026.55 ft<sup>3</sup>

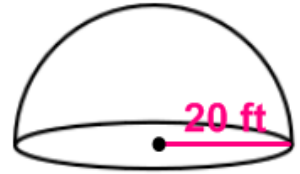
C) 16755.16 ft<sup>3</sup>

D) 33510.32 ft<sup>3</sup>

$$V = \frac{2\pi r^3}{3}$$

$$V = \frac{2\pi (20)^3}{3}$$

$$V = 16755.16 \text{ ft}^3$$



32. Find the value of x.

A) 8.09 cm

B) 5.88 cm

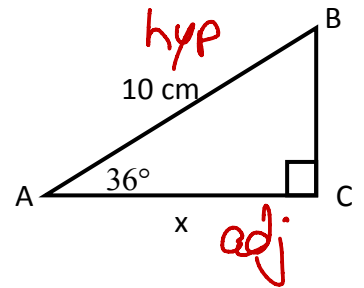
C) 7.27 cm

D) 12.36 cm

$$\cos 36 = \frac{x}{10}$$

$$10 \cos 36 = x$$

$$8.09 = x$$



33. Find the exact values of x and y.

A)  $x = 8\sqrt{3}$ ;  $y = 16$

B)  $x = 4\sqrt{3}$ ;  $y = 4$

C)  $x = 8$ ;  $y = 8\sqrt{2}$

D)  $x = 8\sqrt{2}$ ;  $y = 16$

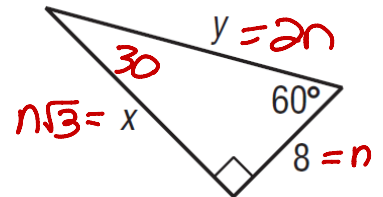
$$x = n\sqrt{3}$$

$$y = 2n$$

$$x = 8\sqrt{3}$$

$$y = 2(8)$$

$$y = 16$$



34. Find the exact value of x.

A) 4

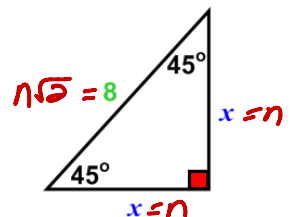
B) 16

C)  $4\sqrt{2}$

D)  $8\sqrt{2}$

$$\frac{8}{\sqrt{2}} = \frac{n\sqrt{2}}{\sqrt{2}}$$

$$\frac{8}{\sqrt{2}} = n \rightarrow n = \frac{8\sqrt{2}}{2} = 4\sqrt{2}$$



35. Find the exact value of  $x$ .

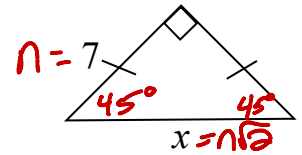
A)  $7\sqrt{3}$

B) 14

C)  $7\sqrt{2}$

D)  $\frac{7\sqrt{2}}{2}$

$x = n\sqrt{2}$   
 $x = 7\sqrt{2}$



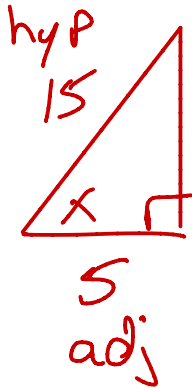
36. A 15-foot ladder leans against a wall and is positioned 5 feet away from the base of the wall. Find the angle of elevation that the ladder forms with the ground.

A)  $71.6^\circ$

B)  $19.5^\circ$

C)  $18.4^\circ$

D)  $70.5^\circ$



$\cos x = \frac{5}{15}$

$x = \cos^{-1}\left(\frac{5}{15}\right)$

$x = 70.5^\circ$

37. Find the value of  $x$  if segments  $ST$  and  $SU$  are tangent to circle  $L$ .

A)  $x = 18$

B)  $x = 1$

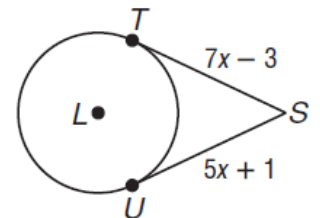
C)  $x = 15.17$

D)  $x = 2$

$7x - 3 = 5x + 1$

$2x = 4$

$x = 2$



38. Find the value of  $x$  and  $y$ .

A)  $x = 90$ ;  $y = 32$

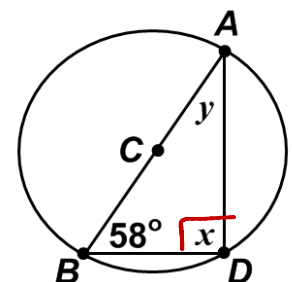
B)  $x = 64$ ;  $y = 58$

C)  $x = 58$ ;  $y = 64$

D)  $x = 29$ ;  $y = 93$

$y = 180 - 90 - 58$

$y = 32$





39. Which expression could be used to find the value of  $x$ ?

A)  $x = 15 * \cos(33^\circ)$

B)  $x = \frac{15}{\cos(33^\circ)}$

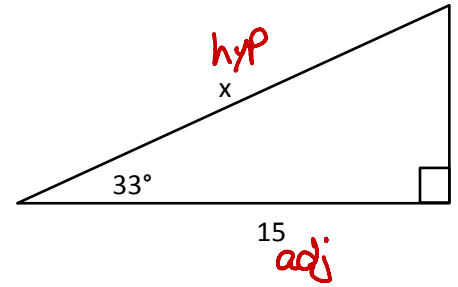
C)  $x = 15 * \sin(33^\circ)$

D)  $x = \frac{15}{\sin(33^\circ)}$

$$\frac{\cos 33 = 15}{x}$$

$$x \cos 33 = 15$$

$$x = \frac{15}{\cos 33}$$



40. Find the measure of  $\widehat{RAB}$

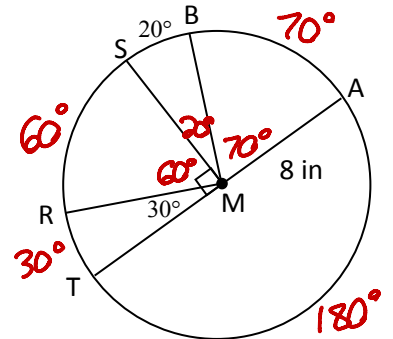
A)  $210^\circ$

B)  $280^\circ$

C)  $270^\circ$

D)  $250^\circ$

$$\begin{aligned} m\widehat{RAB} &= 30 + 180 + 70 \\ &= 280^\circ \end{aligned}$$



41. Find the value of  $x$ .

A)  $x = 29$

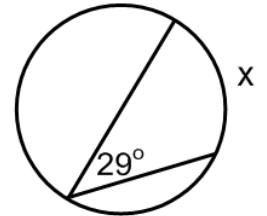
B)  $x = 58$

C)  $x = 32$

D)  $x = 302$

$$x = 2(29)$$

$$x = 58$$



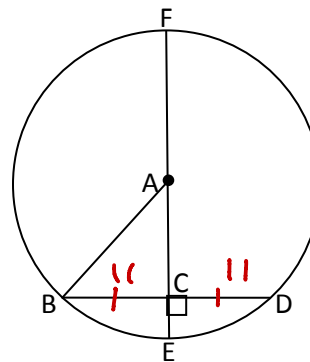
42. Find BD if CD = 11.

A) 5.5

B) 11

C) 16.5

D) 22



43. IF  $BD = 14$  and  $AC = 24$ , find AB.

A) 7

B) 22.96

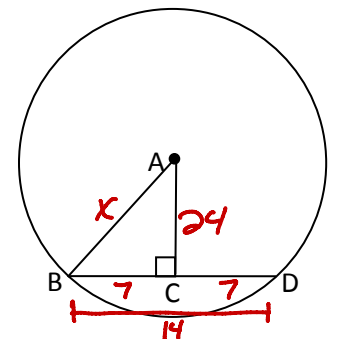
C) 25

D) 31

$$7^2 + 24^2 = x^2$$

$$625 = x^2$$

$$25 = x$$



44. Find the  $m\widehat{ABC}$ .

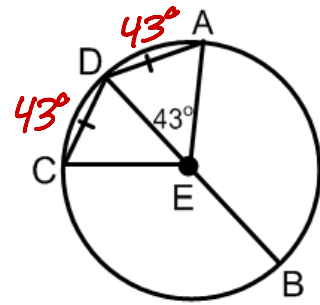
A)  $223^\circ$

B)  $274^\circ$

C)  $137^\circ$

D)  $317^\circ$

$$m\widehat{ABC} = 360 - 43 - 43 = 274$$



45.  $\overline{AB}$  and  $\overline{AC}$  are tangent to the circle. Find AC.

A)  $6/13$

B) 6

C) 42

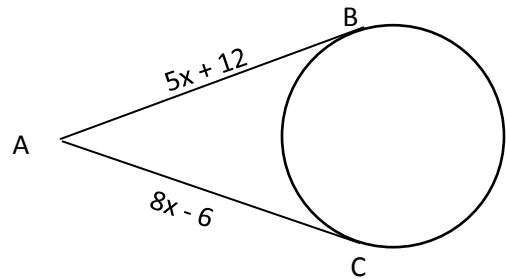
D) 48

$$8x - 6 = 5x + 12$$

$$3x = 18$$

$$x = 6$$

$$AC = 8(6) - 6 = 42$$



46. Find the length of  $\widehat{AB}$ .

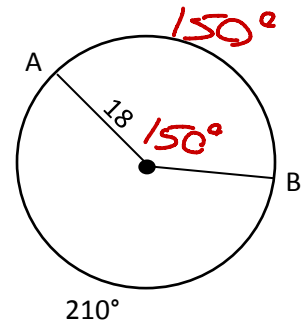
A)  $15\pi \approx 47.1$

B)  $21\pi \approx 66.0$

C)  $135\pi \approx 424.1$

D)  $189\pi \approx 593.8$

$$\widehat{AB} = \frac{150}{360} \cdot 2\pi(18) = 15\pi \approx 47.1$$



47. Find  $m\widehat{CD}$ .

A)  $35^\circ$

B)  $70^\circ$

C)  $110^\circ$

D)  $145^\circ$

$$m\widehat{CD} = 180 - 35 - 35 = 110^\circ$$

