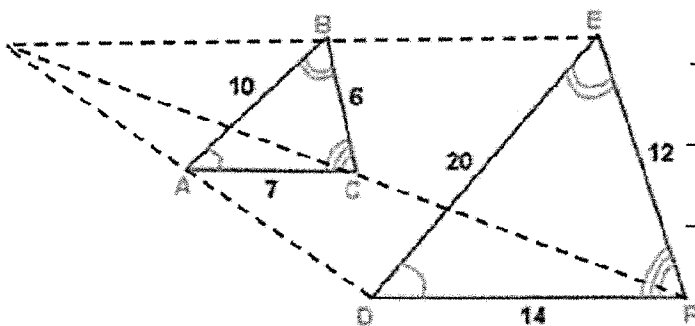


1. Is triangle ABC similar to triangle DEF? Explain your reasoning using both your knowledge of sides and angles. Show your work.

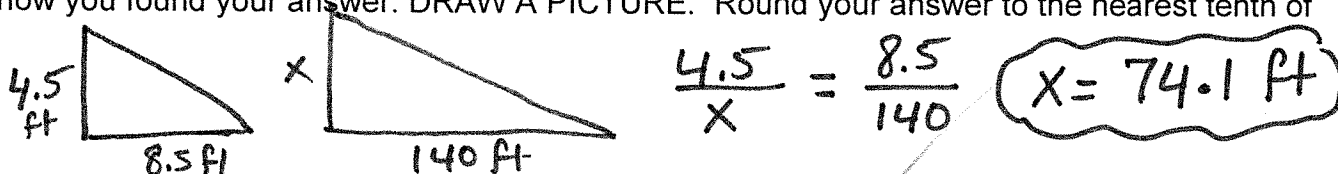


$\angle B \cong \angle E$  ;  $\angle A \cong \angle D$  ;  
 $\angle C \cong \angle F$   
 $\triangle ABC \sim \triangle DEF$  by AAA.

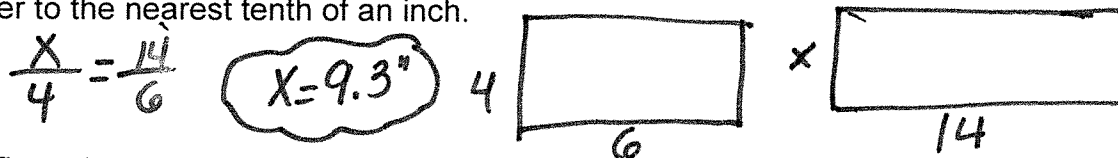
2. For each statement, decide whether you agree or disagree with it and explain your reasoning.

Statement	True	False	Explain your reasoning
All rectangles are similar.		✓	Not all the time depends on ratio of sides.
All triangles are similar.		✓	Angles may vary
When I enlarge a geometric figure by a ratio of 2, both the sides and angles double in size.		✓	only Sides doubles, Angles do not change.
All Circles are similar	✓		No matter how you Transform it stays the Same.
All Squares are similar	✓		All angles and all Sides Same

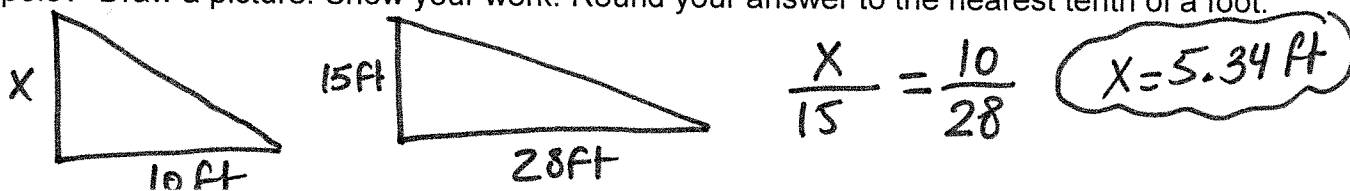
3. A girl is 4ft 6in tall and casts a shadow that is 8 ft. 6 in. long. The end of her shadow coincides with the end of the shadow cast by a building 140 ft from the girl. Find the height of the building. Explain or show how you found your answer. DRAW A PICTURE. Round your answer to the nearest tenth of a foot.



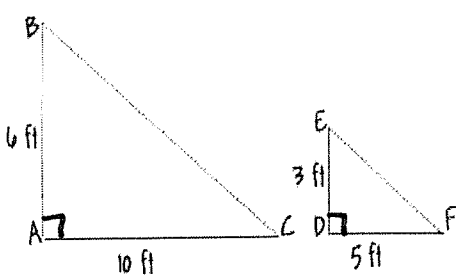
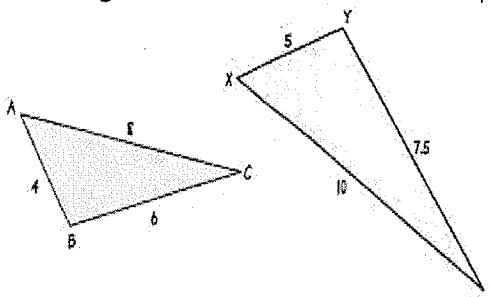
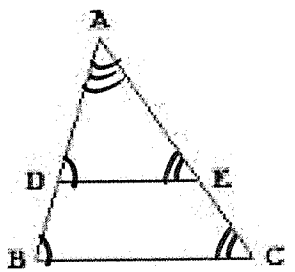
4. A family picture is 4"(width) by 6"(length). You want to enlarge the picture so that the new length is 14". What will the new width be of the enlarged photo? Draw a picture. Show your work. Round your answer to the nearest tenth of an inch.



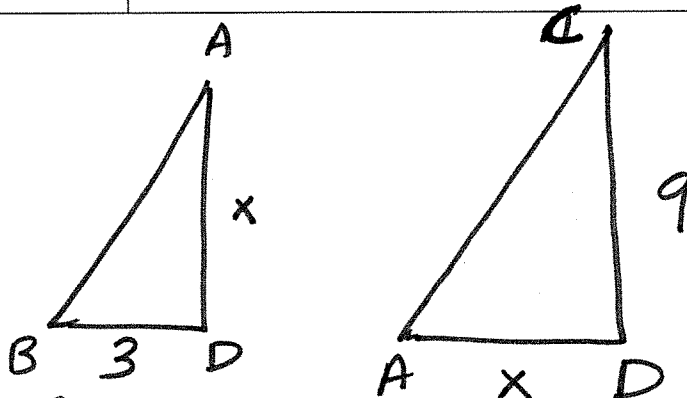
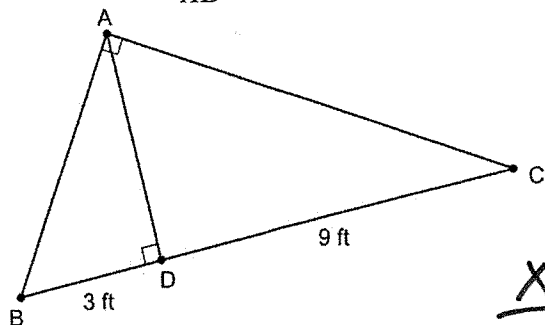
5. A flagpole casts a 10 foot shadow. At the same time a 15 ft tree casts a 28 foot shadow. How tall is the pole? Draw a picture. Show your work. Round your answer to the nearest tenth of a foot.



6. Which of the following diagrams contains similar triangles? How do you know they are similar?

	Similar	Not Similar	Explain your reasoning (make sure you state a theorem/postulate and support sides with ratios)
<p>Is triangle BAC ~ triangle EDF?</p> <p>Do Not assume angles are congruent unless marked.</p> 	✓		$\frac{6}{3} \stackrel{?}{=} \frac{10}{5} = 2$ Similar Side $\angle A \cong \angle D$ right angle $\triangle BAC \sim \triangle EDF$ by SAS
<p>Is triangle ABC ~ triangle XYZ?</p> 	✓		$\frac{4}{5} = \frac{6}{7.5} = \frac{8}{10} = 0.8$ They are similar by SSS
<p><math>\overline{DE} \parallel \overline{BC}</math></p> <p>Is triangle ABC ~ triangle ADE</p> 	✓		$\angle D \cong \angle B$ $\angle E \cong \angle C$ } Corresponding angles $\angle A \cong \angle A$ Same angle $\triangle ABC \sim \triangle ADE$ by AAA

7. Solve for  $\overline{AD}$

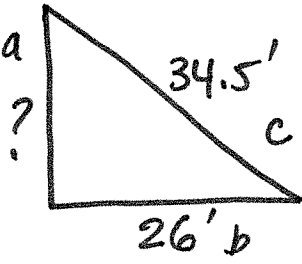


$$\frac{x}{9} = \frac{3}{x}$$

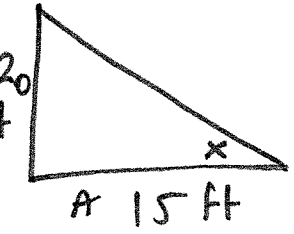
$$\sqrt{x^2} = \sqrt{27}$$

$$(x = 5.2 \text{ ft})$$

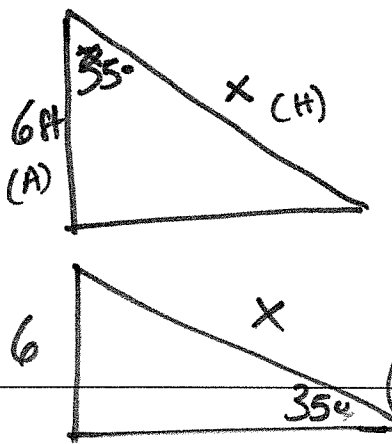
8. A cabinet has a diagonal length of 34.5 inches and a width of 26 inches. You only have room for a 20 inch tall cabinet. Will this cabinet fit? How do you know?

Picture	Work	Answer
	$a^2 + b^2 = c^2$ $x^2 + (26)^2 = (34.5)^2$ $x^2 = 514.25$ $x = 22.7'$	<p>yes, The Cabinet will fit in the room.</p>

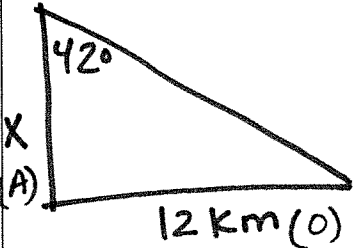
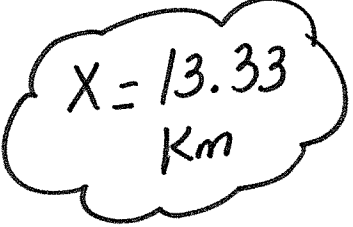
9. A flag pole is 32 feet tall. You are standing 15 feet away from the flag pole. What is your angle of elevation to see the top of the flag pole?

Picture	Work	Answer
	$\tan^{-1}\left(\frac{32}{15}\right) = x$ $x = 64.9^\circ$	<p>64.9°</p>

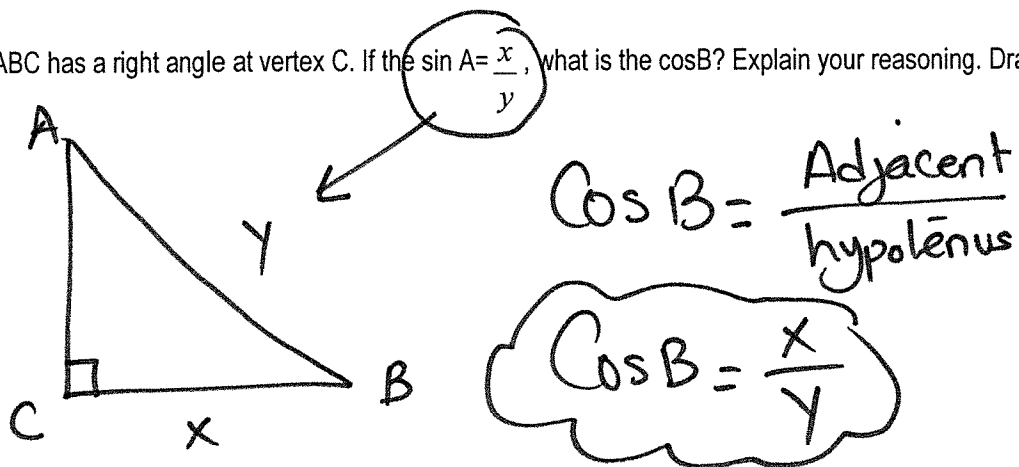
10. Jayla is in the environmental club at school. As part of a community outreach program, they are planting trees around their neighborhood. The trees will need a support rope attached until the roots begin to grow to stand on their own. If the trees are 6 feet tall and the rope has to make an angle of 35° with the ground, how much support rope will they need? (Hint: You need 2 support ropes, one for each side!)

Picture	Work	Answer
	$\cos 35^\circ = \frac{6}{x}$ $x = 7.32$ <p>one side</p> $\sin 35^\circ = \frac{6}{x}$ $x = 10.4$	<p>Support on both sides</p> $2(7.32)$ $= 14.65$ <p>20.8 rope</p>

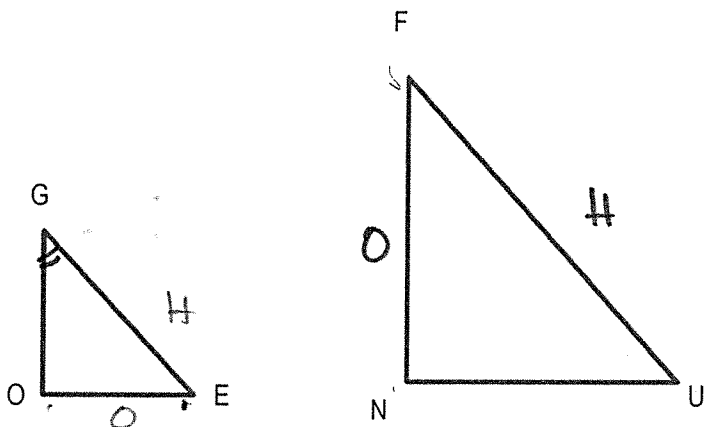
11. Sumaai is standing on top of a cliff looking down at a boat. Her angle of depression to see the boat is  $42^\circ$ . If the boat is 12 km away from the base of the cliff, how tall is the cliff?

Picture	Work	Answer
	$\tan 42^\circ = \frac{12}{X}$ $0.9 = \frac{12}{X}$	

12.  $\triangle ABC$  has a right angle at vertex C. If the  $\sin A = \frac{x}{y}$ , what is the  $\cos B$ ? Explain your reasoning. Draw a picture.



13.  $\triangle GEO \sim \triangle FUN$ . The  $\sin G = \frac{7}{25}$ . Angle O and angle N are right angles. Determine which of the ratios below are the same and explain your reasoning. Hint: Find the missing side!

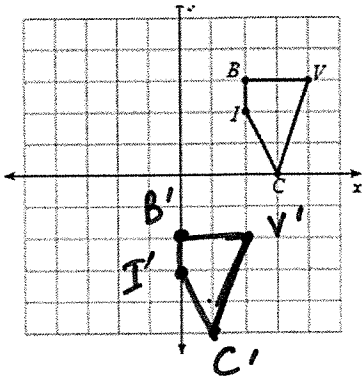


Ratio	Same? Y or N	Explanation
$\sin G$ & $\cos E$	Y	$\sin G = \frac{OE}{GE}$ $\cos E = \frac{OE}{GE}$
$\tan E$ & $\tan G$	N	$\tan E = \frac{OG}{OE}$ $\tan G = \frac{OE}{OG}$
$\sin U$ & <u><math>\sin G</math></u>	N	$\sin U = \frac{NF}{UF}$ $\sin G = \frac{OE}{GE}$
$\sin U$ & $\cos F$	Y	$\sin U = \frac{NF}{UF}$ $\cos F = \frac{NF}{UF}$
$\cos G$ & $\tan U$	N	$\cos G = \frac{OG}{EG}$ $\tan U = \frac{NF}{NU}$
$\cos G$ & $\cos F$	Y	$\cos G = \frac{OG}{EG}$ $\cos F = \frac{NF}{UF}$
$\sin G$ & $\cos U$	Y	$\sin G = \frac{OE}{GE}$ $\cos U = \frac{NU}{UF}$
$\tan F$ & $\tan G$	Y	$\tan F = \frac{NU}{FN}$ $\tan G = \frac{OE}{GO}$

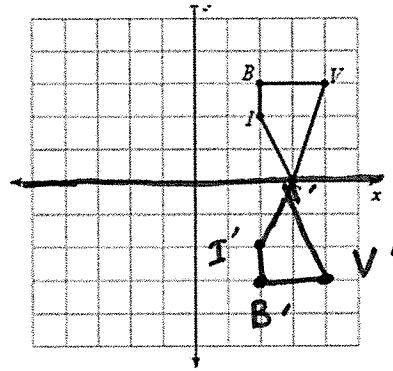


14. Translate 2 units left, 5 units down.

Rule:  $(x, y) \rightarrow (x-2, y-5)$

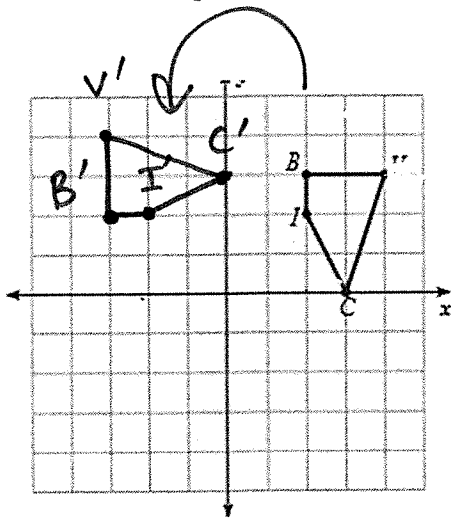


15. Reflect across the x axis.



16. Rotate the figure 90° CCW.

*Counter Clockwise*



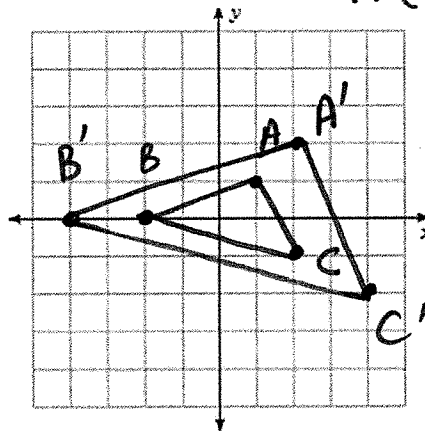
17. Dilate the figure by a scale factor of 2.

$A(1, 1)$   $B(-2, 0)$   $C(2, -1)$

$A'(2, 2)$

$B'(-4, 0)$

$C'(4, -2)$



18. What are the new coordinates of  $A(-3, 7)$   $B(5, 1)$   $C(6, 0)$  when it has been rotated:

a) 180° CCW:  $A'(3, -7)$   $B'(-5, 1)$   $C'(-6, 0)$  (flip the signs only)

b) 90° Clockwise:  $A'(7, 3)$   $B'(1, 5)$   $C'(0, 6)$  (flip the numbers  
change sign of 1<sup>st</sup> number)

↓ ←

19. A figure has been translated 4 units down and 3 units to the left. How would you describe the transformation?

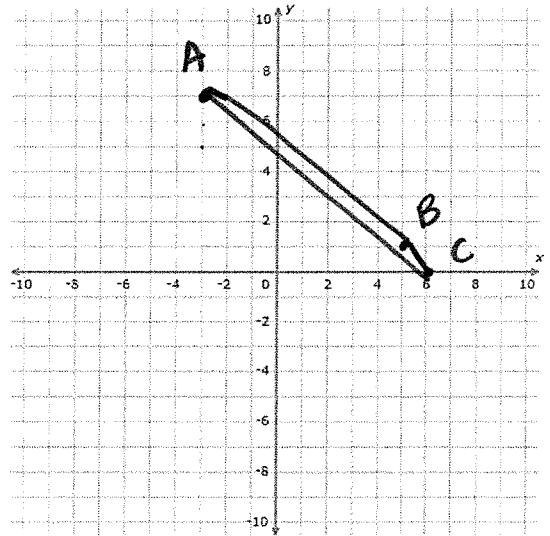
$(x, y) \rightarrow (x-3, y-4)$ . Use your rule to find the new coordinates of the figure:  $A(4, -1)$   $B(2, -3)$   $C(-2, 5)$

$A'(-1, -4)$   $B'(-1, -7)$   $C'(-5, 1)$

20. What are the new coordinates of A(-3, 7) B(5, 1) C(6,0) when it has been reflected over the:

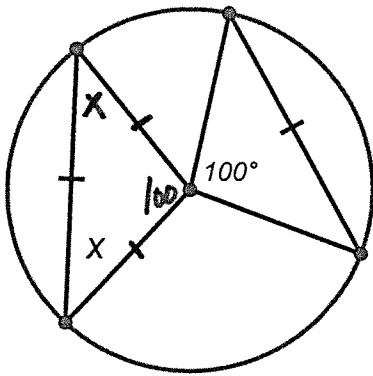
a) x-axis: A'(-3, -7) B'(5, -1) C'(6, 0)

b) y-axis: A''(3, 7) B''(-5, 1) C''(-6, 0)



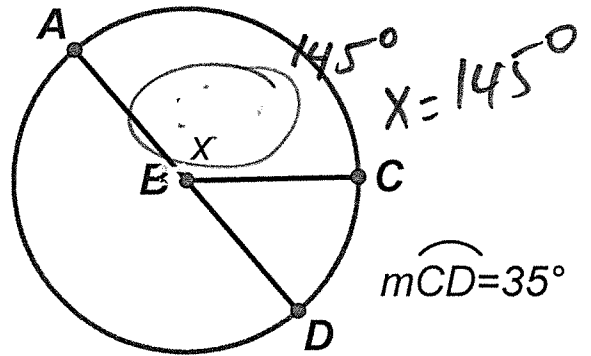
Find the value of x in the circles shown below.

21.

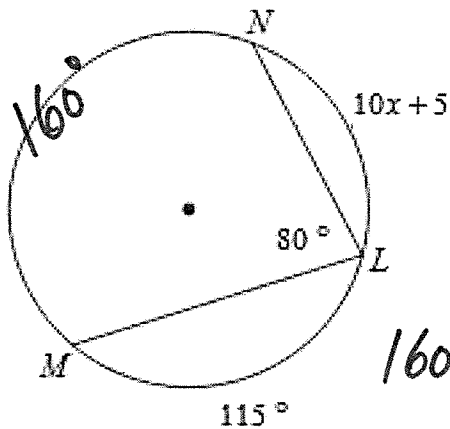


$$x = 40^\circ$$

22.



23.



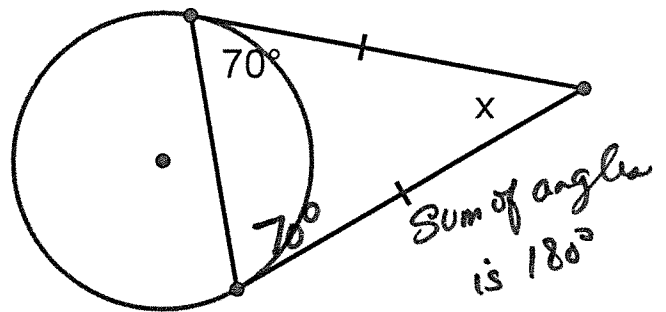
$$160^\circ + 115^\circ + 10x + 5 = 360^\circ$$

$$10x + 280 = 360$$

$$\frac{10x}{10} = \frac{80}{10}$$

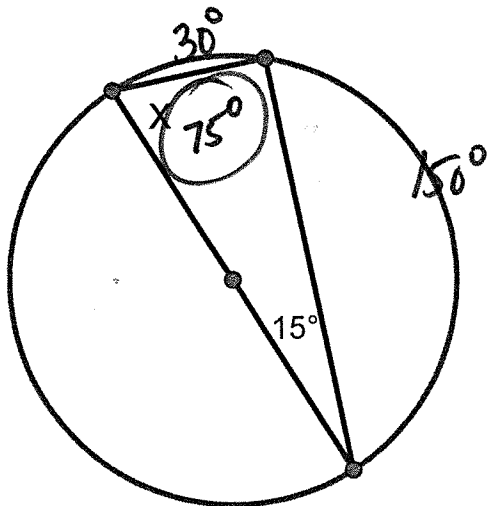
$$x = 8$$

24.

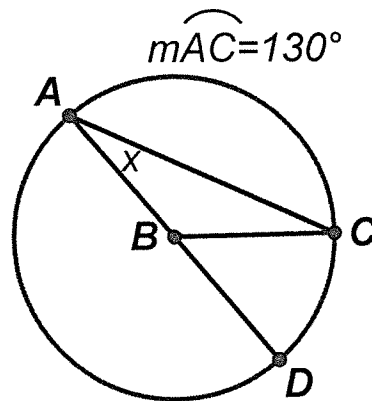


$$x = 40^\circ$$

25.



26.



Use the picture in question 26.

27. Name a radius BD

28. Name a chord AC

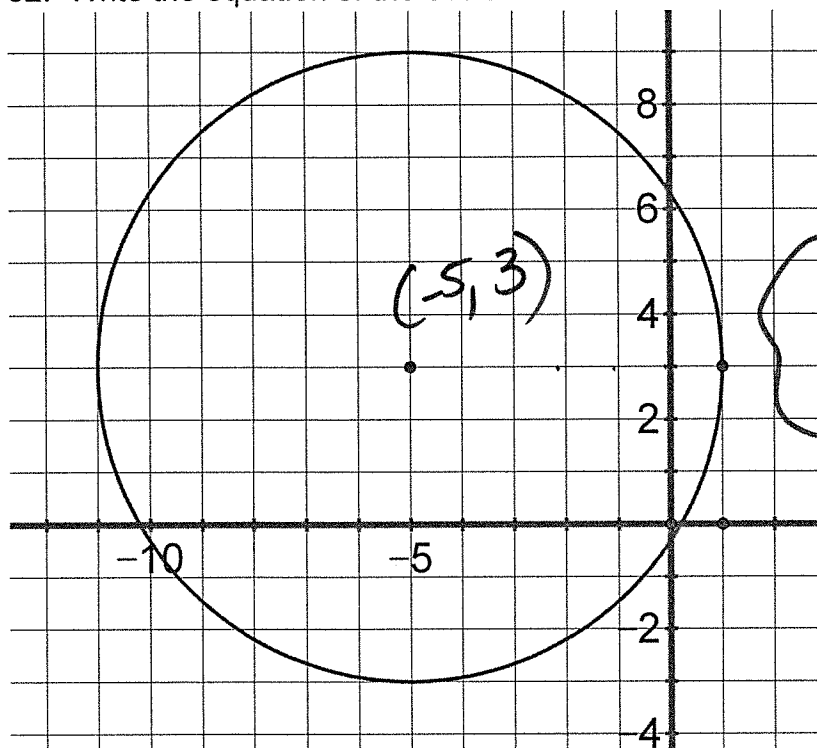
29. Name a diameter AD

30. Name an arc AC

31. Find the area of a sector with a central angle of  $70^\circ$  and radius of 10 feet.

$$\frac{\theta}{360^\circ} \cdot \pi r^2 = \frac{70^\circ}{360^\circ} \cdot \pi (10)^2 = 61.1 \text{ ft}^2$$

32. Write the equation of the circle shown below.



Center  $(-5, 3)$   
h k

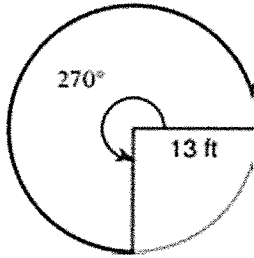
$$r = 6$$

$$(x + 5)^2 + (y - 3)^2 = 36$$



Find the arc length

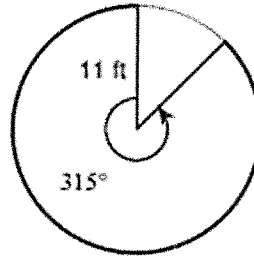
33.



$$\frac{270}{360} \cdot 2\pi r = \frac{270}{360} \cdot 2\pi(13)$$

**61.23 ft**

34.

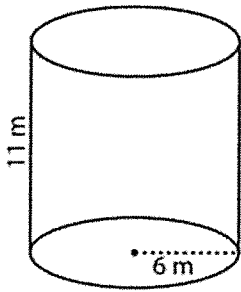


$$\frac{315}{360} \cdot 2\pi r$$

$$\frac{315}{360} \cdot 2\pi(11)$$

**60.4 ft**

35. Find the volume of the cylinder

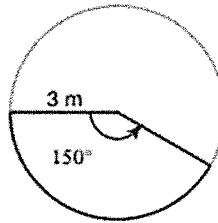


$$V = \pi r^2 h$$

$$V = \pi(36) \cdot 11$$

**V = 1243 m<sup>3</sup>**

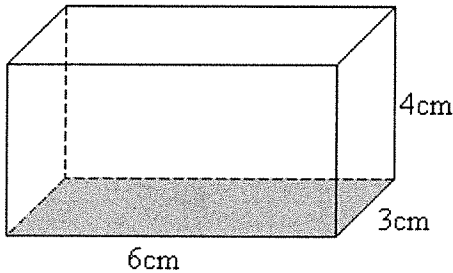
36. Find the area of the sector



$$\frac{150}{360} \cdot \pi(3)^2$$

**11.8 m<sup>2</sup>**

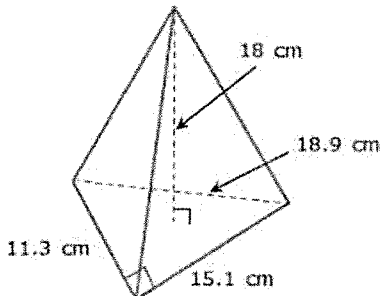
37. Find the volume of the rectangular prism



$$l \cdot w \cdot h = 6 \times 4 \times 3$$

**V = 72 cm<sup>3</sup>**

38. Find the volume of the triangular pyramid



$$\frac{1}{2} \left( \frac{l \cdot w \cdot h}{3} \right)$$

$$\frac{1}{2} \left( \frac{11.3 \cdot 15.1 \cdot 18}{3} \right) = \text{511.9 cm}^3$$

