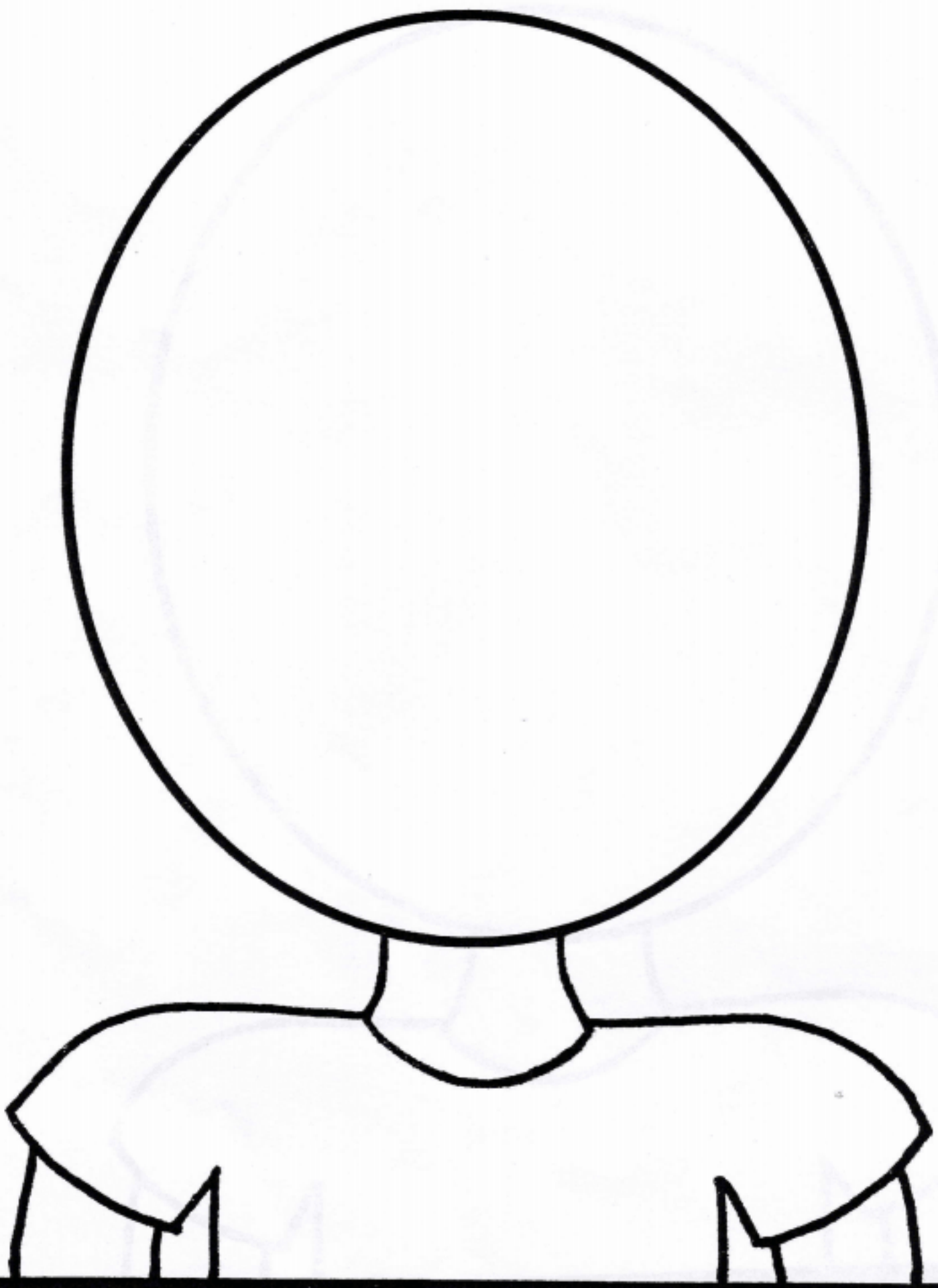


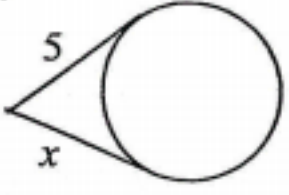




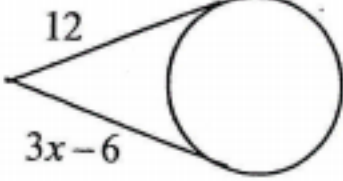

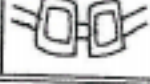

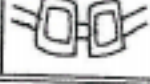
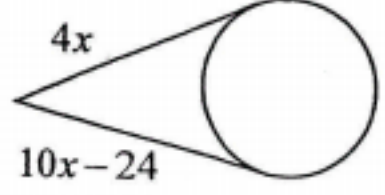

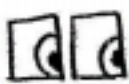

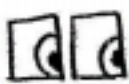



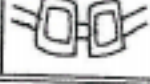

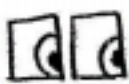
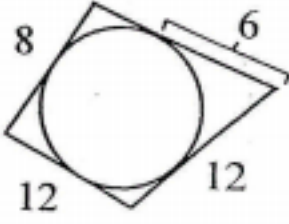
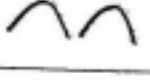
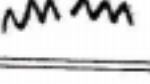
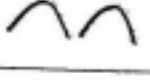
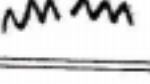
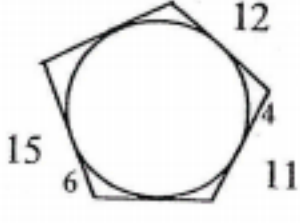

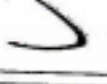

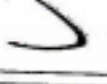
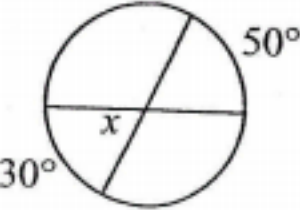




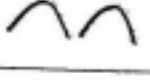
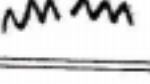

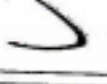


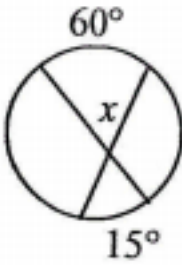




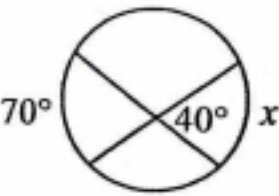















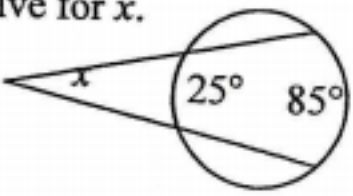

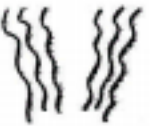

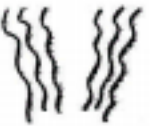
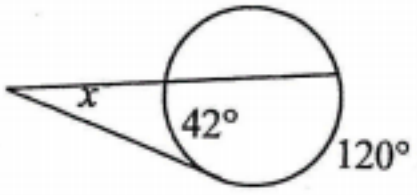




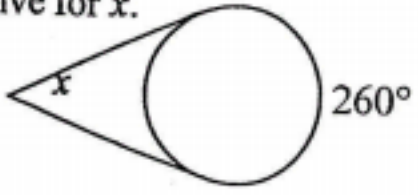





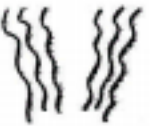




Geometry Per: \_\_\_\_\_ WS# \_\_\_\_\_ Name: \_\_\_\_\_





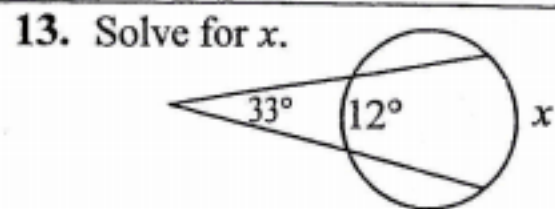
## Lesson 20: Circles: Tangents and Secants

**Directions:** Solve each problem and use a pencil to DRAW the object that corresponds with your answer. SHOW YOUR STEPS!!!

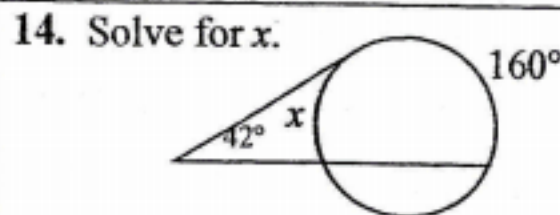
|  |   |   |   |   |  |  |   |  |   |  |   |   |   |   |
|--|---|---|---|---|--|--|---|--|---|--|---|---|---|---|
| <p>1. Solve for <math>x</math>.</p>  <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 80%; padding: 2px;">(a) If <math>x = 5</math> draw the following leather helmet on the head.</td> <td style="width: 20%; text-align: center;"></td> </tr> <tr> <td style="padding: 2px;">(b) If <math>x = 25</math> draw the following leather helmet on the head.</td> <td style="text-align: center;"></td> </tr> </table>   | (a) If $x = 5$ draw the following leather helmet on the head.                               |    | (b) If $x = 25$ draw the following leather helmet on the head.                          |    | <p>2. Solve for <math>x</math>.</p>  <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 80%; padding: 2px;">(a) If <math>x = 12</math> draw the following goggles.</td> <td style="width: 20%; text-align: center;"></td> </tr> <tr> <td style="padding: 2px;">(b) If <math>x = 6</math> draw the following goggles.</td> <td style="text-align: center;"></td> </tr> </table>  | (a) If $x = 12$ draw the following goggles.                            |    | (b) If $x = 6$ draw the following goggles.                             |    | <p>3. Solve for <math>x</math>.</p>  <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 80%; padding: 2px;">(a) If <math>x = 4</math> draw the following eyes inside the goggles.</td> <td style="width: 20%; text-align: center;"></td> </tr> <tr> <td style="padding: 2px;">(b) If <math>x = 6</math> draw the following eyes inside the goggles.</td> <td style="text-align: center;"></td> </tr> </table>                                      | (a) If $x = 4$ draw the following eyes inside the goggles.                |    | (b) If $x = 6$ draw the following eyes inside the goggles.                |    |
| (a) If $x = 5$ draw the following leather helmet on the head.  |            |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (b) If $x = 25$ draw the following leather helmet on the head.   |            |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (a) If $x = 12$ draw the following goggles.  |          |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (b) If $x = 6$ draw the following goggles.   |          |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (a) If $x = 4$ draw the following eyes inside the goggles.   |          |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (b) If $x = 6$ draw the following eyes inside the goggles.   |          |   |   |   |  |  |   |  |   |  |   |   |   |   |
| <p>4. Perimeter = ____.</p>  <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 80%; padding: 2px;">(a) If <math>P = 40</math> draw the following eyebrows.</td> <td style="width: 20%; text-align: center;"></td> </tr> <tr> <td style="padding: 2px;">(b) If <math>P = 42</math> draw the following eyebrows.</td> <td style="text-align: center;"></td> </tr> </table>   | (a) If $P = 40$ draw the following eyebrows.  |  | (b) If $P = 42$ draw the following eyebrows.  |  | <p>5. Perimeter = ____.</p>  <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 80%; padding: 2px;">(a) If <math>P = 68</math> draw the following nose.</td> <td style="width: 20%; text-align: center;"></td> </tr> <tr> <td style="padding: 2px;">(b) If <math>P = 66</math> draw the following nose.</td> <td style="text-align: center;"></td> </tr> </table>  | (a) If $P = 68$ draw the following nose.                               |  | (b) If $P = 66$ draw the following nose.                               |  | <p>6. Solve for <math>x</math>.</p>  <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 80%; padding: 2px;">(a) If <math>x = 10^\circ</math> draw the following smile.</td> <td style="width: 20%; text-align: center;"></td> </tr> <tr> <td style="padding: 2px;">(b) If <math>x = 40^\circ</math> draw the following smile.</td> <td style="text-align: center;"></td> </tr> </table>   | (a) If $x = 10^\circ$ draw the following smile.                           |  | (b) If $x = 40^\circ$ draw the following smile.                           |  |
| (a) If $P = 40$ draw the following eyebrows.   |          |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (b) If $P = 42$ draw the following eyebrows.   |          |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (a) If $P = 68$ draw the following nose.   |        |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (b) If $P = 66$ draw the following nose.   |        |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (a) If $x = 10^\circ$ draw the following smile.  |        |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (b) If $x = 40^\circ$ draw the following smile.  |        |   |   |   |  |  |   |  |   |  |   |   |   |   |
| <p>7. Solve for <math>x</math>.</p>  <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 80%; padding: 2px;">(a) If <math>x = 22.5^\circ</math> draw a scar on one arm.</td> <td style="width: 20%; text-align: center;"></td> </tr> <tr> <td style="padding: 2px;">(b) If <math>x = 37.5^\circ</math> draw a scar on the face.</td> <td style="text-align: center;"></td> </tr> </table>   | (a) If $x = 22.5^\circ$ draw a scar on one arm.   |  | (b) If $x = 37.5^\circ$ draw a scar on the face.  |  | <p>8. Solve for <math>x</math>.</p>  <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 80%; padding: 2px;">(a) If <math>x = 10^\circ</math> draw the following shoulder straps on the shirt.</td> <td style="width: 20%; text-align: center;"></td> </tr> <tr> <td style="padding: 2px;">(b) If <math>x = 55^\circ</math> draw the following shoulder straps on the shirt.</td> <td style="text-align: center;"></td> </tr> </table> | (a) If $x = 10^\circ$ draw the following shoulder straps on the shirt. |  | (b) If $x = 55^\circ$ draw the following shoulder straps on the shirt. |  | <p>9. Solve for <math>x</math>.</p>  <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 80%; padding: 2px;">(a) If <math>x = 40^\circ</math> draw the following large parachute above the head.</td> <td style="width: 20%; text-align: center;"></td> </tr> <tr> <td style="padding: 2px;">(b) If <math>x = 20^\circ</math> draw the following large parachute above the head.</td> <td style="text-align: center;"></td> </tr> </table>    | (a) If $x = 40^\circ$ draw the following large parachute above the head.  |  | (b) If $x = 20^\circ$ draw the following large parachute above the head.  |  |
| (a) If $x = 22.5^\circ$ draw a scar on one arm.  |          |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (b) If $x = 37.5^\circ$ draw a scar on the face.   |          |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (a) If $x = 10^\circ$ draw the following shoulder straps on the shirt.   |        |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (b) If $x = 55^\circ$ draw the following shoulder straps on the shirt.   |        |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (a) If $x = 40^\circ$ draw the following large parachute above the head.   |        |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (b) If $x = 20^\circ$ draw the following large parachute above the head.   |        |   |   |   |  |  |   |  |   |  |   |   |   |   |
| <p>10. Solve for <math>x</math>.</p>  <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 80%; padding: 2px;">(a) If <math>x = 30^\circ</math> draw straight lines to attach the parachute to the back of the shirt.</td> <td style="width: 20%; text-align: center;"></td> </tr> <tr> <td style="padding: 2px;">(b) If <math>x = 55^\circ</math> draw wavy lines to attach the parachute to the back of the shirt.</td> <td style="text-align: center;"></td> </tr> </table> | (a) If $x = 30^\circ$ draw straight lines to attach the parachute to the back of the shirt. |  | (b) If $x = 55^\circ$ draw wavy lines to attach the parachute to the back of the shirt. |  | <p>11. Solve for <math>x</math>.</p>  <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 80%; padding: 2px;">(a) If <math>x = 81^\circ</math> draw TWO birds on the LEFT side of the picture.</td> <td style="width: 20%; text-align: center;"></td> </tr> <tr> <td style="padding: 2px;">(b) If <math>x = 39^\circ</math> draw TWO clouds on the LEFT side of the picture.</td> <td style="text-align: center;"></td> </tr> </table> | (a) If $x = 81^\circ$ draw TWO birds on the LEFT side of the picture.  |  | (b) If $x = 39^\circ$ draw TWO clouds on the LEFT side of the picture. |  | <p>12. Solve for <math>x</math>.</p>  <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 80%; padding: 2px;">(a) If <math>x = 180^\circ</math> draw THREE birds on the RIGHT side of the picture.</td> <td style="width: 20%; text-align: center;"></td> </tr> <tr> <td style="padding: 2px;">(b) If <math>x = 80^\circ</math> draw THREE clouds on the RIGHT side of the picture.</td> <td style="text-align: center;"></td> </tr> </table> | (a) If $x = 180^\circ$ draw THREE birds on the RIGHT side of the picture. |  | (b) If $x = 80^\circ$ draw THREE clouds on the RIGHT side of the picture. |  |
| (a) If $x = 30^\circ$ draw straight lines to attach the parachute to the back of the shirt.  |          |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (b) If $x = 55^\circ$ draw wavy lines to attach the parachute to the back of the shirt.  |          |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (a) If $x = 81^\circ$ draw TWO birds on the LEFT side of the picture.  |        |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (b) If $x = 39^\circ$ draw TWO clouds on the LEFT side of the picture.   |        |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (a) If $x = 180^\circ$ draw THREE birds on the RIGHT side of the picture.  |        |   |   |   |  |  |   |  |   |  |   |   |   |   |
| (b) If $x = 80^\circ$ draw THREE clouds on the RIGHT side of the picture.  |        |   |   |   |  |  |   |  |   |  |   |   |   |   |



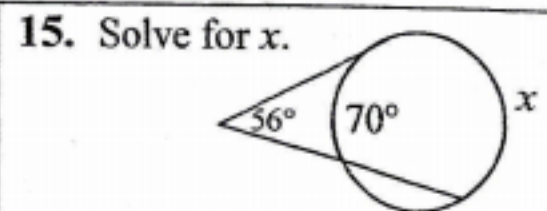
**Directions:** Solve each problem and **COLOR** the object that corresponds with your answer.  
**SHOW YOUR STEPS!!!**



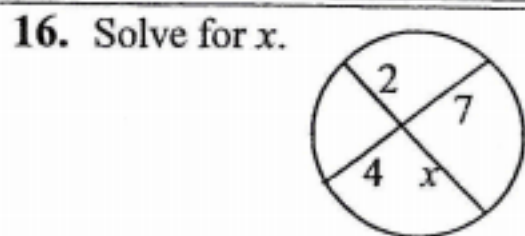
- (a) If  $x = 22.5^\circ$  color the leather helmet gray.  
(b) If  $x = 78^\circ$  color the leather helmet brown.



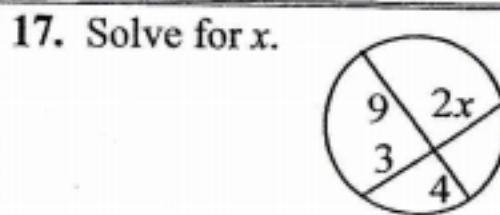
- (a) If  $x = 76^\circ$  color the eyes green.  
(b) If  $x = 118^\circ$  color the eyes blue.



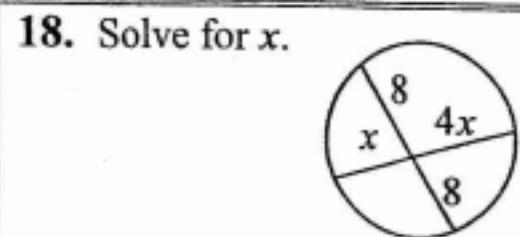
- (a) If  $x = 126^\circ$  color the goggles gray.  
(b) If  $x = 182^\circ$  color the goggles brown.



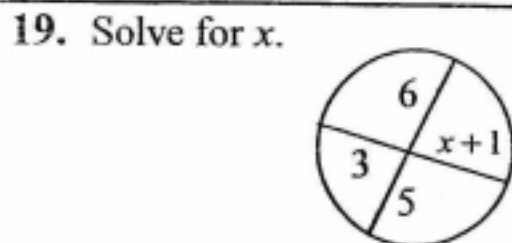
- (a) If  $x = 28$  color the nose pink.  
(b) If  $x = 14$  color the nose apricot.



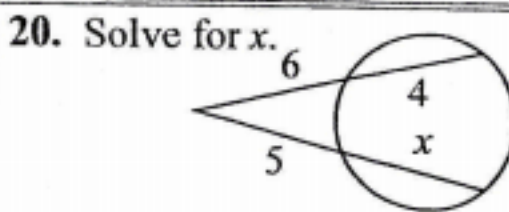
- (a) If  $x = 6$  color the face, neck, and arms apricot.  
(b) If  $x = 18$  color the face, neck, and arms pink.



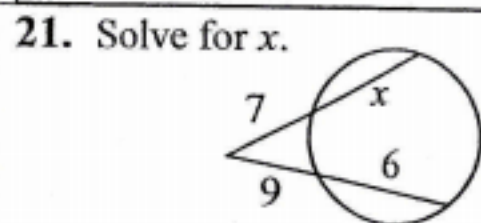
- (a) If  $x = 4$  outline the eyebrows black.  
(b) If  $x = 8$  outline the eyebrows in red.



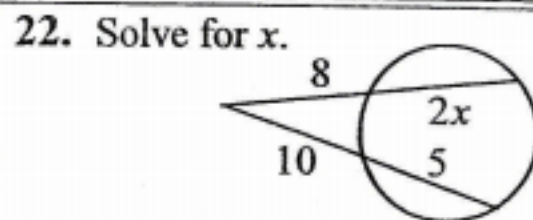
- (a) If  $x = 10$  outline the nose in orange.  
(b) If  $x = 9$  outline the nose in black.



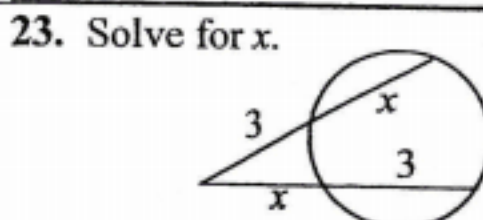
- (a) If  $x = 7$  outline the mouth in black.  
(b) If  $x = \frac{24}{5}$  outline the mouth in red.



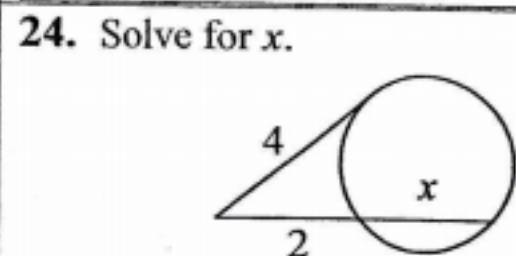
- (a) If  $x = \frac{24}{7}$  outline the scar in red.  
(b) If  $x = \frac{86}{7}$  outline the scar in black.



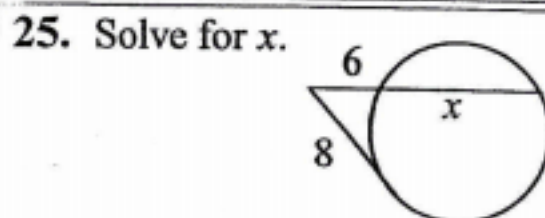
- (a) If  $x = \frac{25}{8}$  color the shoulder straps red.  
(b) If  $x = \frac{43}{8}$  color the shoulder straps brown.



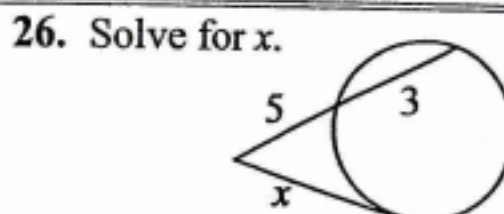
- (a) If  $x = 1$  color the shirt yellow.  
(b) If  $x = 3$  color the shirt green.



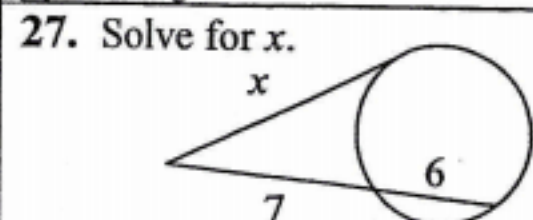
- (a) If  $x = 6$  color the parachute yellow, blue, and red.  
(b) If  $x = 2$  color the parachute pink and green.



- (a) If  $x = \frac{14}{3}$  outline the parachute and its lines in black.  
(b) If  $x = \frac{4}{3}$  outline the parachute and its lines in purple.



- (a) If  $x = \sqrt{15}$  color the clouds gray.  
(b) If  $x = 2\sqrt{10}$  outline the clouds in black, but do not color them.



- (a) If  $x = \sqrt{91}$  color the rest of the background blue.  
(b) If  $x = \sqrt{42}$  leave the rest of the background gray.

**Artistic Tip:** When you are done coloring, it looks nice to outline the major features using a black crayon or marker.