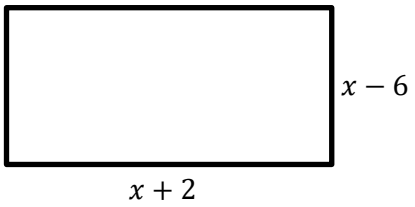
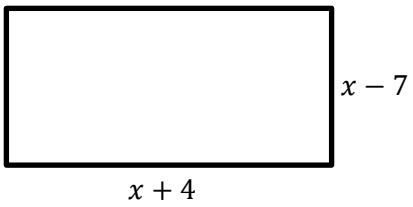
Quadratic Problem Solving

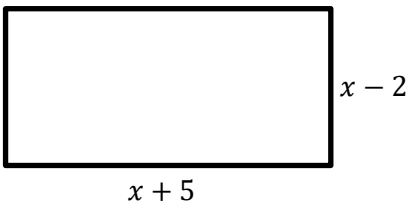
1. The rectangle shown has an area of $33cm^2$.
a. Show that $x^2 - 4x + 45 = 0$.
b. Calculate the length and breadth of the rectangle.



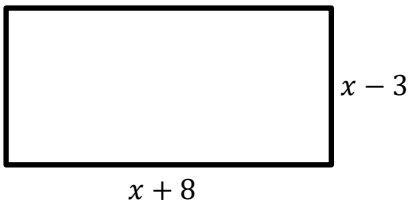
2. The rectangle shown has an area of $42cm^2$.
a. Show that $x^2 - 3x - 70 = 0$.
b. Calculate the length and breadth of the rectangle.



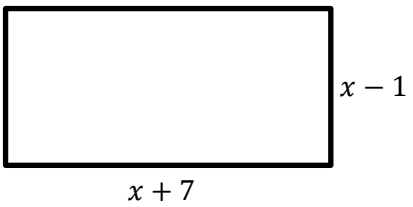
3. The rectangle shown has an area of $78cm^2$.
a. Show that $x^2 + 3x - 88 = 0$.
b. Calculate the length and breadth of the rectangle.



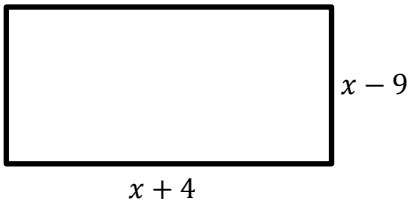
4. The rectangle shown has an area of $60cm^2$.
a. Show that $x^2 + 5x + 84 = 0$.
b. Calculate the length and breadth of the rectangle.



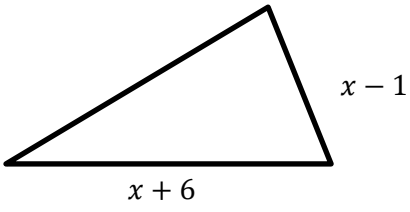
5. The rectangle shown has an area of $48cm^2$.
a. Show that $x^2 + 6x - 55 = 0$.
b. Calculate the length and breadth of the rectangle.



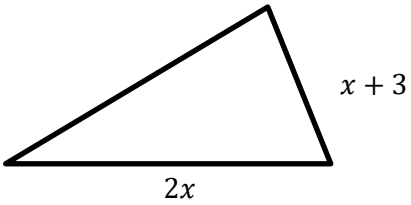
6. The rectangle shown has an area of $464cm^2$.
a. Show that $x^2 - 5x - 500 = 0$.
b. Calculate the length and breadth of the rectangle.



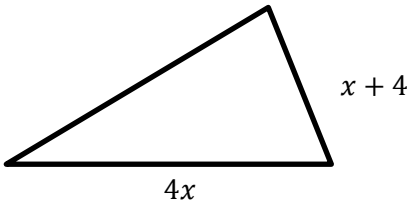
7. The triangle shown has an area of $15cm^2$.
a. Show that $x^2 + 5x - 36 = 0$
b. Calculate the length of the base and the height.



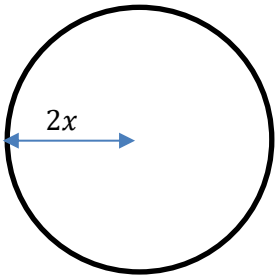
8. The triangle shown has an area of $28cm^2$.
a. Show that $x^2 + 3x - 28 = 0$
b. Calculate the length of the base and the height.



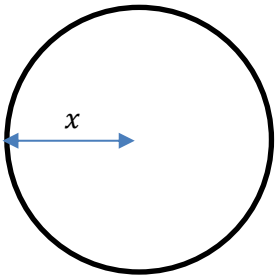
9. The triangle shown has an area of $154cm^2$.
a. Show that $x^2 + 4x - 77 = 0$
b. Calculate the length of the base and the height.



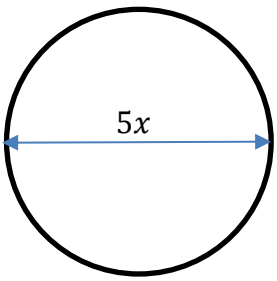
10. The circle shown has a radius of $2x$ and an area of $25\pi cm^2$.
a. Show that $4x^2 - 25 = 0$
b. Calculate the radius of the circle.



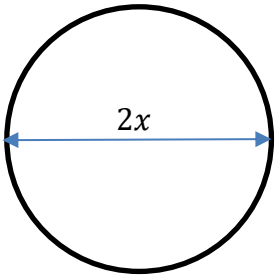
11. The circle shown has an area of $49\pi cm^2$.
Show that $x^2 - 49 = 0$



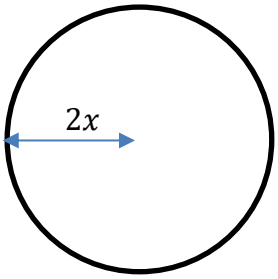
12. The circle shown has a radius of $5x$ and an area of $9\pi cm^2$
a. Show that $25x^2 - 36 = 0$
b. Calculate the length of the diameter.



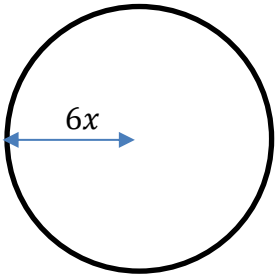
13. The circle shown has a diameter of $4x$ and an area of 18π.
a. Show that $x^2 - 18 = 0$
b. Calculate the diameter of the circle as a surd in it's simplest form.



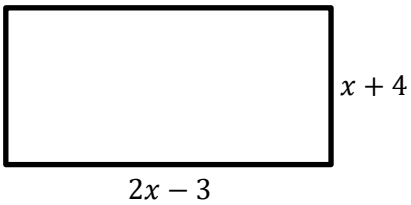
14. The circle shown has a radius of $2x$ and an area of 80π.
a. Show that $x^2 - 20 = 0$
b. Calculate the radius of the circle as a surd in it's simplest form.

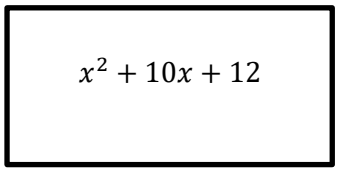


15. The circle shown has an area of 64π.
a. Show that $36x^2 - 64 = 0$
b. Solve $36x^2 - 64 = 0$



16. The two rectangles have equal areas.

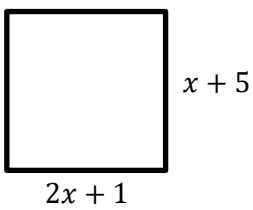


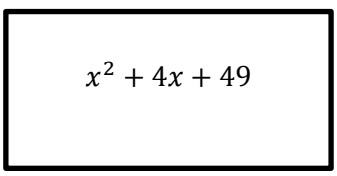


The rectangle on the left has diamensions $2x - 3$ and $x + 4$.
The rectangle on the right has an area of $(x^2 + 10x + 12)cm^2$

a. Show that $x^2 - 5x - 24 = 0$.
b. Calculate the area of each rectangle.
c. Calculate the length and breadth of the left triangle.

17. Two rectangles shown have equal areas.





The rectamngle of the left has dimensions $2x + 1$ and $x + 5$.
The rectangle of the right has an area of $(x^2 + 4x + 49)cm^2$
a. Show that $x^2 + 7x - 44 = 0$.
b. Calculate the area of the two rectangles.
c. Calcualte the length and breadth of the left rectangle.

Answers

All part *a* from questions are show that, therefore I have not included the solutions here.

1. b. 11cm and 3cm

2. b. 14cm and 3cm

3. b. 13cm and 6cm

4. b. 15cm and 4cm

5. b. 12cm and 4cm

6. b. 29cm and 16cm

7. b. 10cm and 3cm

8. b. 8cm and 7cm

9. b. 28cm and 11cm

10. b. 5cm.

11.

12. b. 6cm

13. b. $6\sqrt{2}$cm

14. b. $4\sqrt{5}$cm

15. b. 8cm

16. b. 132cm^2 c. 13cm and 12cm

17. b. 81cm^2 c. 9cm and 9cm