Name:

Exam Style Questions

Forming and Solving Equations

Corbettmaths

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You may use tracing paper if needed

Guidance

1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings
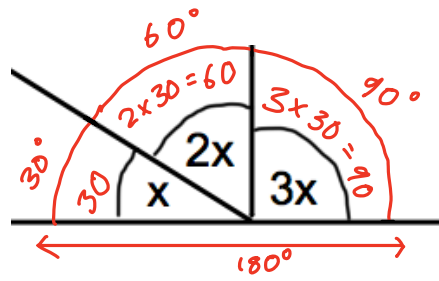
Revision for this topic

www.corbettmaths.com/contents

Video 114

Video 115

1.   Three angles made up a straight line.

$60°$
$2 \times 30 = 60$ $3 \times 30 = 90$ $90°$
$30°$ 30 **2x**
x **3x** 0
$180°$

(a) Form an equation in x.

angles on a straight line = 180°

$$2x + 3x + x = 180$$

(2)

(b)   Solve the equation to find the value of x

$2x + 3x = 6x$ $6x = 180$

$6\,\overline{)180}^{30}$

x = ...30...⁰

(2)

(c)   Work out the size of the largest angle.

(see annotations on diagram)

.........90.........⁰

(1)

2.

$$5x + 3$$

$$2x \qquad\qquad 2x$$

$$3x + 9$$
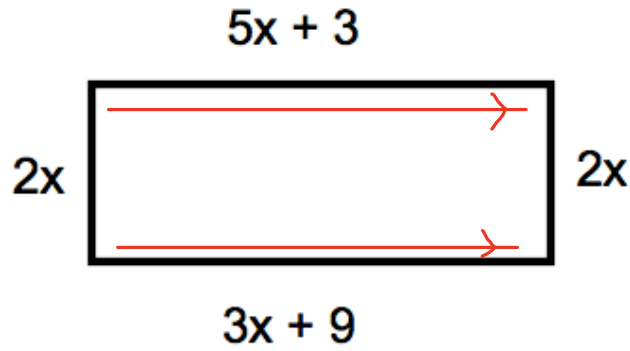
The diagram shows a rectangle. The sides are measured in centimetres.

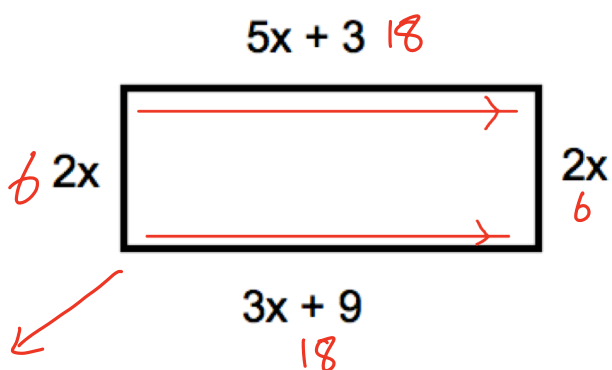(a) Explain why $5x + 3 = 3x + 9$

Both sides are equal and parallel

....

(1)

(b) Solve $5x + 3 = 3x + 9$

minus 3 from both sides so we have 'x' on only one side

$$2x + 3 = 9$$
$$2x = 6$$
$$x = \frac{6}{2} \ (6 \div 2)$$
$$x = 3$$

x =......3......cm

(2)

(c) Calculate the perimeter of the rectangle.

perimeter =

$$\frac{12}{6} = 6$$

$$5x + 3 \quad 18$$

$$6 \ 2x \qquad\qquad 2x \ 6$$

$$3x + 9$$
$$18$$

$$\begin{array}{r} 1\,8 \\ 1\,8 \\ 1\,2 \\ \hline 4\,8 \\ 1 \end{array}$$

$$18$$
......4 8......cm

(2)

(copied by me for easy reference)

3.   Sarah is x years old.
     Thomas is 3 years older than Sarah.
     David is twice as old as Sarah.
     The total of their ages is 51.

   (a) Write an expression for Thomas's age in terms of x.

   Sarah = x

   Thomas = 3 years older

   Thomas = x + 3

   $x + 3$

   (1)

   (b) Write an expression for David's age in terms of x.

   David = x 2 of Sarah

   David = 2x

   $2x$

   (1)

   (c) Form an equation in x and solve it to work out Sarah's age.

   $x + x + 3 + 2x = 51$

   $4x + 3 = 51$

   $4x = 51 - 3$

   $4x = 48$

   $x = \dfrac{48}{4}$

   $x = 12$

   12

   (2)

4.   James has x pence.
     Hannah has 5 pence more than James.
     Liam has 2 pence less than James.

$$24 + 29 + 22 = 75$$

The total amount of money they have is 75 pence.

(a) Use this information to write down an equation in x.

$$x + 5 + x + x - 2 = 75$$

$$3x + 5 - 2$$
$$3x + 3 = 75$$

$$\underline{3x + 3 = 75}$$
(2)

(b) Solve the equation to find out how much money James has.
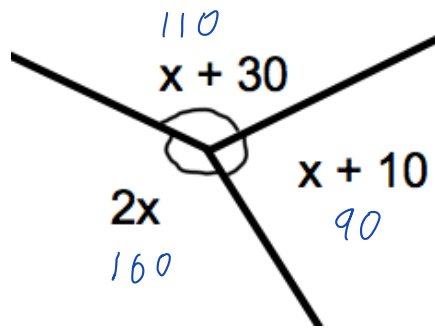
$$3x + 3 = 75$$

$$3x = 75 - 3$$

$$3x = 72$$

$$x = \frac{72}{3}$$

$$x = 24$$

.........24.........pence
(2)

5. Three angles meet at a point.

110
x + 30
x + 10
90
2x
160

$2x + x + 10 + x + 30$
$= 360$

Calculate the size of the largest angle.

$110 + 90 + 160 = 360$

$4x + 40 = 360$

$4x = 360 - 40$

$4x = 320$

$x = \dfrac{320}{4}$

$x = 80$

.........160.....^{0}

(4)

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6. Shown is a triangle.

x + 20
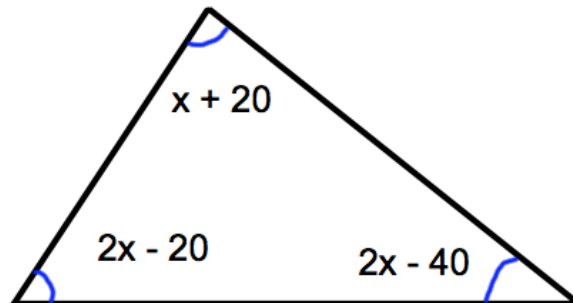
2x - 20   2x - 40

Work out the value of x.

$x + 20 + 2x - 20 + 2x - 40 = 180$

angles in triangle = 180°

$(x + 2x + 2x) + (20 - 20 - 40) = 180$

$5x - 40 = 180$
$5x = 180 + 40$
$5x = 220$
$x = \dfrac{220}{5}$

$x = 44$

x = ...44...........^{0}
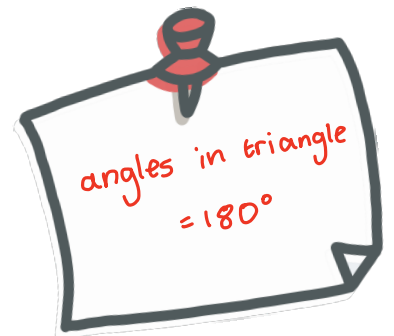
(4)

7.   Shown is a trapezium.

x + 50
110

90

7°
x + 10

90

90
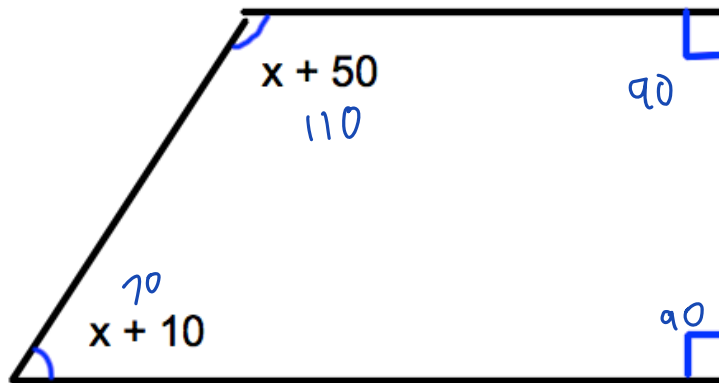
Calculate the size of the largest angle in the trapezium.

$$x + 50 + x + 10 + 90 + 90 = 360$$

$$2x + 240 = 360$$

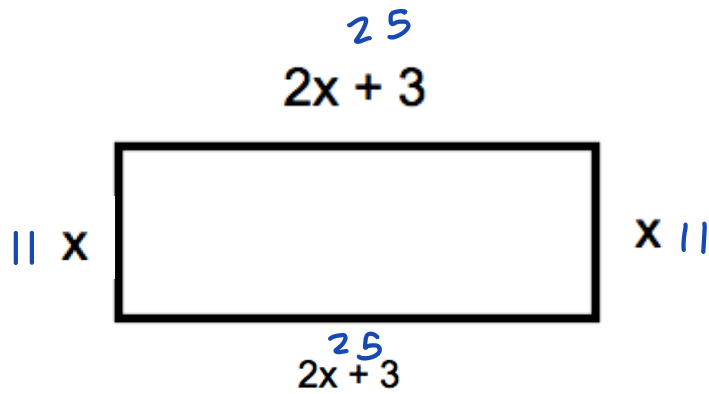$$2x = 360 - 240$$

$$2x = 120$$

$$x = \frac{120}{2}$$

$$x = 60$$

$$\begin{array}{r} 180 \\ 60 \\ \hline 240 \end{array}$$

x = ...110.........°

(4)

8.   Below is a rectangle, with width x cm and length 2x + 3 cm.

2x + 3 ^{25}

$\parallel$ **X**   **X** $\parallel$

2x + 3 ^{25}

The perimeter of the rectangle is 72cm.

Calculate the size of the width and length.

$2x + 3 + 2x + 3 + x + x = 72$

$6x + 6 = 72$

$6x = 72 - 6$

$6x = 66$

$x = \frac{66}{6}$

$x = 11$

Width = ...11......cm

Length = ...25......cm

(4)

9. The cost of an Xbox is £ x
A Playstation costs £15 more than an Xbox.
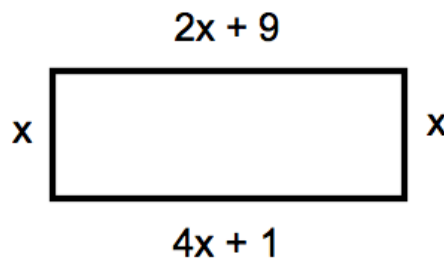The total cost of an Xbox and a Playstation is £335.

Find the cost of a Playstation.

$$x + x + 15 = 335$$
$$2x + 15 = 335$$
$$2x = 335 - 15$$
$$2x = 320$$
$$x = 320 \div 2$$
$$x = 160$$

£ 160

(3)

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10. A rectangle is shown below.

Have a go at this question

2x + 9

x ☐ x

4x + 1

(a) Explain why   4x + 1 = 2x + 9

....

....

(1)

(b) Find the size of x.

x = ...cm

(2)

(c) Work out the area of the rectangle.

.....................cm²

(2)

11. Shown is a pentagon, with the size of each angle shown.
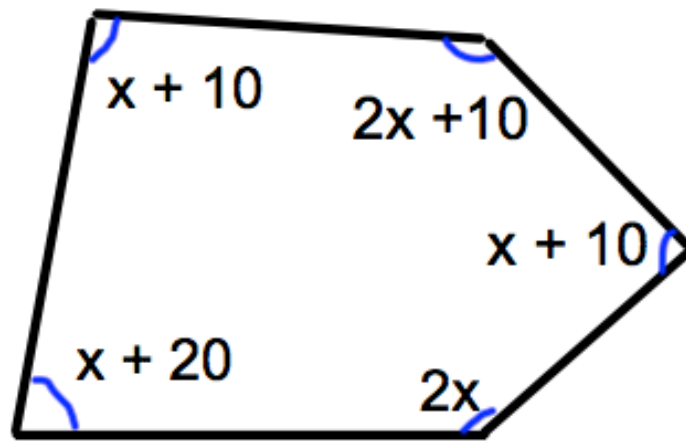
Find the size of the largest angle.

$x + 10 + 2x + 10 + x + 10 + x + 20 + 2x =$
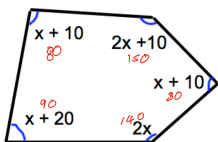
540

$7x + 50 = 540$

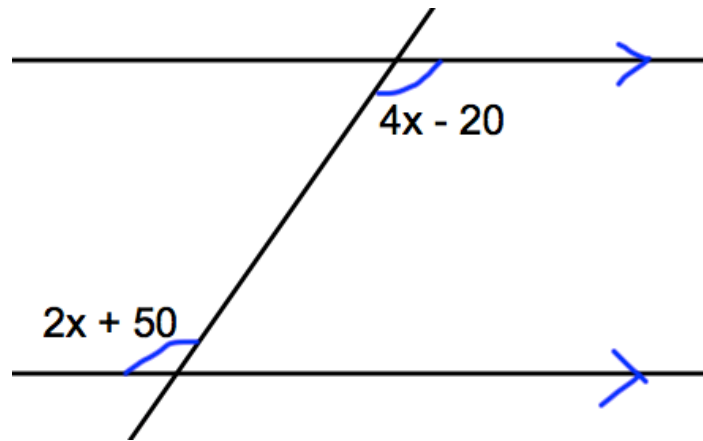$7x = 540 - 50$

$7x = 490$

$x = \dfrac{490}{7}$

$x = 70$

(added by me for easy reference)

.......150.......⁰

(4)

Have a go at the
final 2 questions!

12.   The diagram below shows a pair of parallel lines.

Calculate the size of the angle, 2x + 50.

.......................°

(4)

13. Shown below is an isosceles triangle. Each side is measured in centimetres.

$3x - 1$ ⟋ ⟍ $x + 9$

$x + 1$
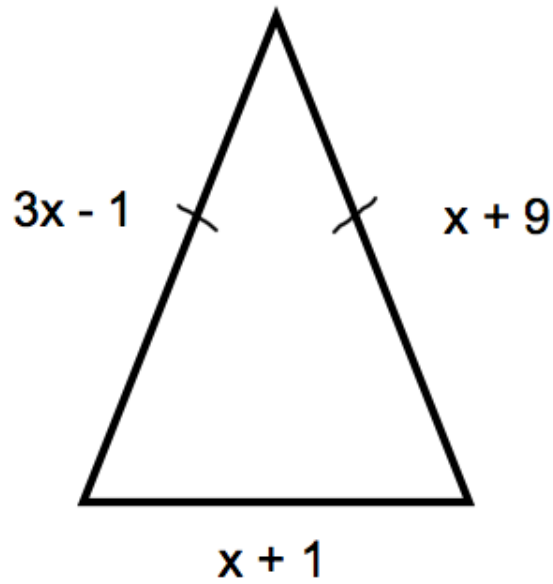
(a) Explain why $3x - 1 = x + 9$

....

....

(1)

(b) Solve the equation above.

$x = $ ....cm

(2)

(c) Calculate the perimeter of the triangle.

.....................cm

(2)