Name:

Exam Style Questions

Forming and Solving Equations

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.
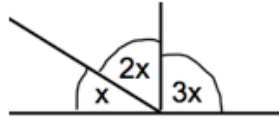4. Check your answers seem right.
5. Always show your workings

Revision for this topic

Video 114
Video 115

1. Three angles made up a straight line.

(a) Form an equation in x.

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

$$\underline{6x = 180}$$

(2)

(b) Solve the equation to find the value of x
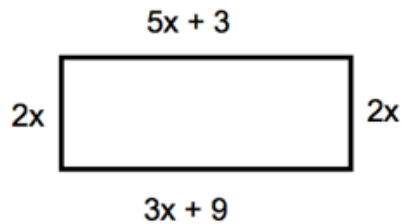
$$6x = 180$$
$$\div 6 \qquad \div 6$$
$$x = 30$$

x = ...30....°

(2)

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

$$30 \times 3 = 90$$

....90....°

(1)

2.

5x + 3

2x   2x

3x + 9

The diagram shows a rectangle. The sides are measured in centimetres.

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

The opposite sides of a rectangle are
the same length, so 5x+3 = 3x+9

(1)

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

$$-3x \quad -3x$$
$$2x + 3 = 9$$
$$-3 \quad -3$$
$$2x = 6$$
$$\div 2 \quad \div 2$$
$$x = 3$$

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

(2)

(c) Calculate the perimeter of the rectangle.

$$5 \times 3 + 3 = 18$$
$$2 \times 3 = 6$$

$$18 + 18 + 6 + 6 = 48$$

48

......cm

(2)

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.

$x+3$

$x+3$ ....
(1)

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

$2x$ ....
(1)

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

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

$4x + 3 = 51$
$\quad -3 \quad\quad -3$
$4x = 48$
$\div 4 \quad\quad \div 4$
$x = 12$

12 ....
(2)

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

    The total amount of money they have is 75 pence.

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

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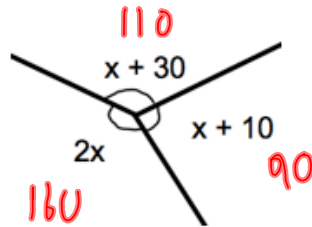 $$3x + 3 = 75$$

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

    (b) Solve the equation to find out how much money James has.

    $$3x + 3 = 75$$
    $$-3 \quad -3$$
    $$3x = 72$$
    $$\div 3 \quad \div 3$$
    $$x = 24$$

    24 pence
    (2)

5. Three angles meet at a point.

110
x + 30
x + 10
2x
160
90

Calculate the size of the largest angle.

$4x + 40 = 360$

$- 40 \qquad -40$

$4x = 320$

$\div 4 \qquad \div 4$

$x = 80$

160 °

(4)

6. Shown is a triangle.

x + 20

2x - 20   2x - 40
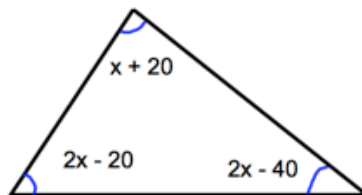
Work out the value of x.

$5x - 40 = 180$

$+40 \qquad +40$

$5x = 220$

$\div 5 \qquad \div 5$

$x = 44$

x = 44 °

(4)

7.   Shown is a trapezium.

110°

x + 50

90

70

x + 10

90

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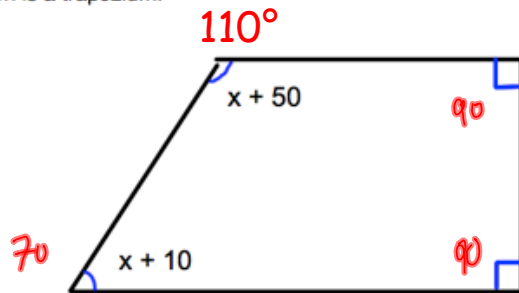
Calculate the size of the largest angle in the trapezium.

$2x + 240 = 360$

$- 240 \qquad -240$
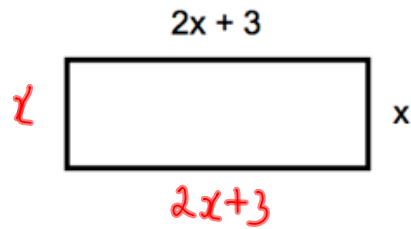
$2x = 120$

$\div 2 \quad \div 2$

$x = 60$

x = **110** °

(4)

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

2x + 3

x

x

$2x+3$

The perimeter of the rectangle is 72cm.

Calculate the size of the width and length.

$$6x + 6 = 72$$
$$-6 \quad -6$$
$$6x = 66$$
$$x = 11$$
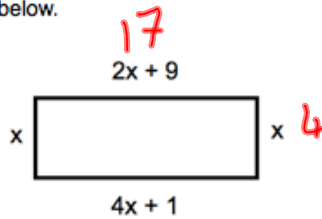
Width = ...11....cm

Length = ...25....cm

(4)

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

   Find the cost of a Playstation.

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

   £ 175
   (3)

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10. A rectangle is shown below.

    17

    2x + 9

    x   x 4

    4x + 1

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

    The opposite sides of a rectangle are
    the same length, so 2x+9 = 4x+1
    (1)

    (b) Find the size of x.

    $4x + 1 = 2x + 9$
    $-2x \quad\quad -2x$
    $2x + 1 = 9$
    $\quad -1 \quad -1$
    $2x = 8$

    4
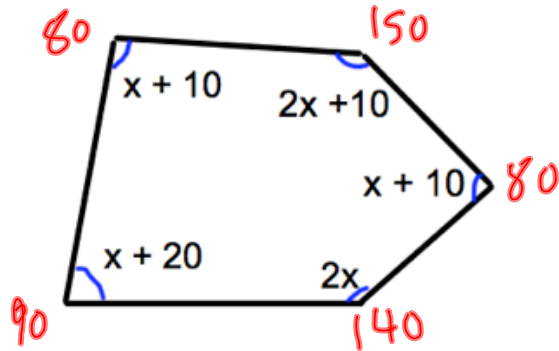   x = ... cm
    (2)

    (c) Work out the area of the rectangle.

    $17 \times 4 = 68$

    68
    .... cm²
    (2)

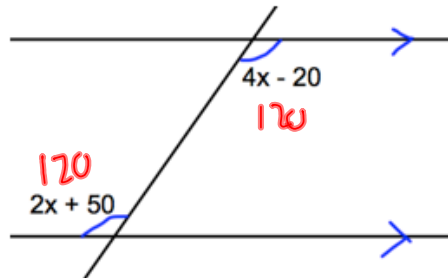11. Shown is a pentagon, with the size of each angle shown.

80   150
x + 10   2x +10

x + 10 80

x + 20   2x
90   140

Find the size of the largest angle.

$$7x + 50 = 540$$
$$7x = 490$$
$$x = 70$$

150

...........................°

(4)

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

4x - 20

1ƶ0

120

2x + 50

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

$2x + 50 = 4x - 20$

$-2x \qquad -2x$

$50 = 2x - 20$

$+20 \qquad +20$

$70 = 2x$

$x = 35$

$2 \times 35 + 50 = 120$

120

.........................⁰

(4)

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

3x - 1   14   x + 9   14

x + 1
6
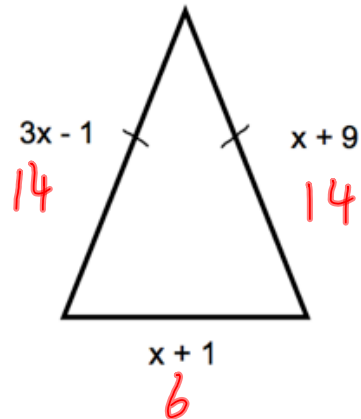
(a) Explain why 3x - 1 = x + 9

As the triangle is isosceles, the sides
that are marked as equal are equal in
length, so 3x - 1 = x + 9   (1)

(b) Solve the equation above.

$3x - 1 = x + 9$

$2x - 1 = 9$

$2x = 10$

$x = 5$

x = ...5.....cm
(2)

(c) Calculate the perimeter of the triangle.

14 + 14 + 6 = 34cm

34
.................cm
(2)