

Name: _____

Class: _____

Teacher: _____

Year 10

Higher

Term 4

Homework Booklet

Week 1

1.4 Starting Six



What is 35% of £130

Work out $£2.69 \times 25$

Write 160 as a product of prime factors

(a) Write 0.028 as a fraction

(b) Simplify your answer

Solve: $\frac{x}{3} = 2\frac{1}{2}$

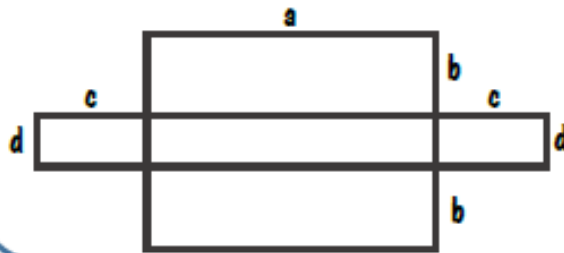
Factorise: $55 - 15b$

Solve: $9x - 5 = 6x + 7$

Factorise: $x^2 - 7x + 12$

Four numbers have a median of 11, a mean of 11 and a range of 14. What could they be?

Shade an area represented by: $(ad + cd)$



IN A COMPANY, THE RATIO OF THE NUMBER OF MEN TO THE NUMBER OF WOMEN IS 9 : 2

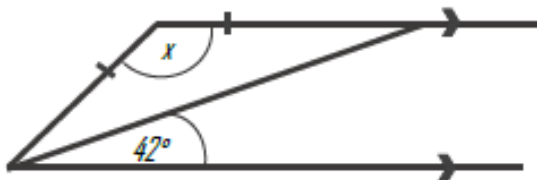
40% OF THE MEN ARE UNDER THE AGE OF 25

IF THERE ARE 100 WORKERS, HOW MANY MEN IN THE COMPANY ARE UNDER THE AGE OF 25?

Write the number of left handed girls to right handed boys as a ratio in its simplest form.

| | Boys | Girls |
|-------|------|-------|
| Left | 9 | 18 |
| Right | 30 | 20 |

AB and CD are parallel. Work out the size of angle x .



Expand:

a) $(2a + 2)(3a - 3)$

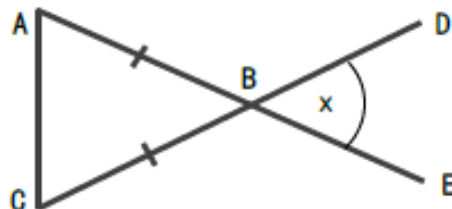
Factorise:

b) $x^2 - 9x + 18$

There are only red pens and green pens in a box. The ratio of the number of red pens in the box to the number of green pens in the box is 3 : 5

What percentage of the pens are green?

The angles in triangle ABC are in the ratio 4:4:1. Find Angle x .



A pancake recipe is made by mixing eggs, flour and milk in the ratio 1:6:3

What fraction is eggs?

$\frac{1}{3}$ $\frac{1}{10}$ $\frac{1}{6}$ $\frac{1}{9}$

Three straight lines are shown. Work out the value of x



Week 1

Match the word with its definition

| | | |
|-----------|--|--|
| Plot | | Mark on a graph |
| Factorise | | Present an informed opinion |
| Congruent | | Use a mathematical instrument to find the size of a length or angle |
| Measure | | Take out the common factor/s or into two brackets if it is a quadratic |
| Comment | | Exactly the same size and shape |

Spot the Mistake

Question 1:

Expand and simplify $4(2x - 3) - 2(3x - 5)$

Lucy's answer:

$$4(2x - 3) - 2(3x - 5)$$

Expand:

$$8x - 12 - 6x - 10$$

Answer:

$$2x - 22$$

Your answer:

What mistake has Lucy made?

Question 2:

Expand and simplify $(p - 6)^2$.

Finlay's answer:

$$(p - 6)^2$$

Answer:

$$p^2 - 36$$

Your answer:

What mistake has Finlay made?

Week 2

1.5 **Starting Six**



What is 35% of £170

Work out $£3.14 \times 22$

Write 170 as a product of prime factors

(a) Write 0.014 as a fraction

(b) Simplify your answer

Solve: $\frac{x}{5} = 2\frac{1}{2}$

Factorise: $14 - 7b$

Solve: $9x - 8 = 6x + 8$

Factorise: $x^2 + 9x + 18$

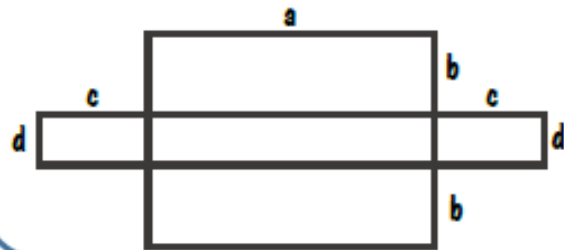
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Top Ten Topics



Four numbers have a median of 11, a mean of 11 and a range of 8. What could they be?

Shade an area represented by: $2(ab + cd)$



IN A COMPANY, THE RATIO OF THE NUMBER OF MEN TO THE NUMBER OF WOMEN IS 3 : 2

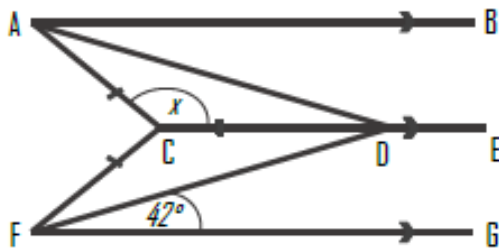
10% OF THE WOMEN ARE UNDER THE AGE OF 25
40% OF THE MEN ARE UNDER THE AGE OF 25

WHAT PERCENTAGE OF PEOPLE IN THE COMPANY ARE UNDER THE AGE OF 25?

Write the number of left handed girls as a fraction of the total students in its simplest form.

| | Boys | Girls |
|-------|------|-------|
| Left | 8 | 18 |
| Right | 30 | 20 |

AB, CDE and FG are parallel. Work out the size of angle x .



Expand:

a) $(2a - 2)(5a - 3)$

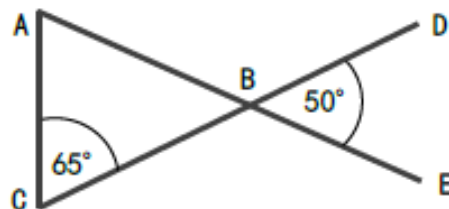
Factorise:

b) $x^2 + 9x - 22$

There are only red pens and green pens in a box. The ratio of the number of red pens in the box to the number of green pens in the box is 7 : 1

What percentage of the pens are red?

Prove that triangle ABC is an isosceles triangle.



A smoothie recipe is made by mixing blueberries, orange and spinach in the ratio 3:6:1

What fraction is orange?

- $\frac{3}{10}$ $\frac{3}{9}$ $\frac{3}{5}$ $\frac{3}{10}$

Three straight lines are shown. Work out the value of x



Week 2

Match the word with its definition

| | | |
|-----------|--|--|
| Rotate | | Collect terms together or cancel down |
| Work out | | Perform one or a set of steps or calculations to arrive at an answer |
| Solve | | Move horizontally and vertically by a given vector |
| Simplify | | Turn around a fixed point |
| Translate | | Arrive at an answer using a numerical or algebraic method |

Spot the Mistake

| | |
|---|---------------------|
| Question 1: Expand and simplify $(x - 4)(x - 3)$. | |
| <i>Finlay's answer:</i> $(x - 4)(x - 3)$ $x^2 - 3x - 4x - 7$ Answer: $x^2 - 7x - 7$ | <i>Your answer:</i> |
| What mistake has Finlay made? | |
| Question 2: Factorise $y^2 + 3y - 10$. | |
| <i>Finlay's answer:</i> $y^2 + 3y - 10$ Answer: $(y + 2)(y - 5)$ | <i>Your answer:</i> |
| What mistake has Finlay made? | |

Week 3

1.7 **Starting Six**



What is 35% of £190

Work out $£2.34 \times 7$

Write 120 as a product of prime factors

(a) Write 0.53 as a fraction

(b) Write $\frac{27}{4}$ as a mixed number

Solve: $\frac{x}{3} = 2\frac{1}{2}$

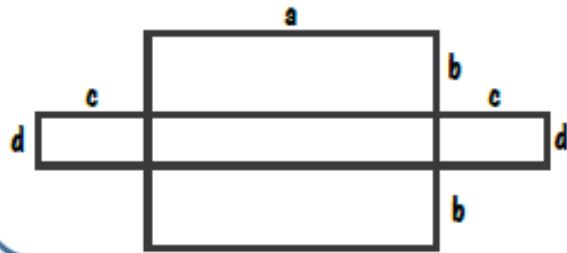
Factorise: $16 - 12m$

Solve: $8x - 6 = 3x + 4$

Factorise: $x^2 - 4x - 12$

Four numbers have a median of 6, a mean of 6 and a range of 7. The numbers are not integers. What could they be?

Shade an approximate area for: $\frac{1}{2}(ab + cd)$



IN A COMPANY, THE RATIO OF THE NUMBER OF MEN TO THE NUMBER OF WOMEN IS 9 : 7

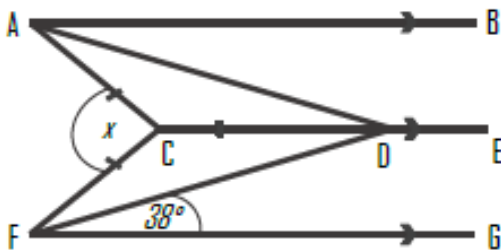
20% OF THE WOMEN ARE UNDER THE AGE OF 30
40% OF THE MEN ARE UNDER THE AGE OF 30

WHAT PERCENTAGE OF PEOPLE IN THE COMPANY ARE UNDER THE AGE OF 30?

Write the number of right handed boys as a fraction of the total students in its simplest form.

| | Boys | Girls |
|-------|------|-------|
| Left | 11 | 29 |
| Right | 21 | 26 |

AB, CDE and FG are parallel. Work out the size of angle x .



Expand:

a) $(2a - 4)(3a - 5)$

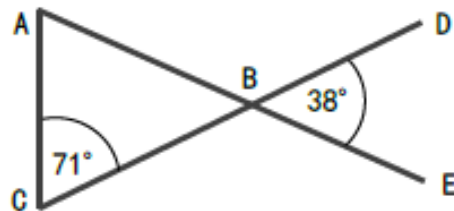
Factorise:

b) $x^2 - 9$

There are orange, yellow and blue sweets in a box. The ratio of the number of orange, yellow and blue sweets in the box is 7 : 3 : 5

What percentage of the sweets are yellow?

Prove that triangle ABC is an isosceles triangle.

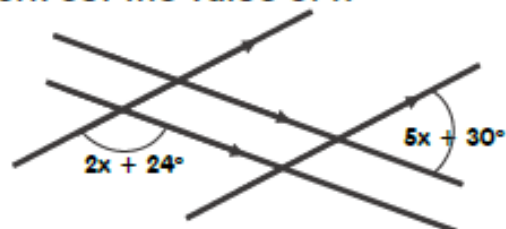


A smoothie recipe is made by mixing mango, berries and kale in the ratio 4:2:3

What fraction is not equivalent to kale?

$\frac{2}{6}$ $\frac{3}{9}$ $\frac{4}{16}$ $\frac{1}{3}$

Four straight lines are shown. Work out the value of x



Week 3

Match the word with its definition

| | | |
|-----------------|--|--|
| Credit | | Data that can only take certain values |
| Continuous Data | | Money put into a bank account |
| Probability | | Data that can take any value |
| Debit | | The chance that something will happen |
| Discrete Data | | Money taken out of a bank account |

Spot the Mistake

| | |
|---|---------------------|
| Question 1: Expand and simplify $(2x - 5)(3x + 1)$. | |
| <i>Finlay's answer:</i> $(2x - 5)(3x + 1)$ $5x^2 + 2x - 15x - 5$ Answer: $5x^2 - 13x - 5$ | <i>Your answer:</i> |
| What mistake has Finlay made? | |
| Question 2: Factorise $2n^2 - 5n - 3$. | |
| <i>Finlay's answer:</i> $2n^2 - 5n - 3$ Answer: $(2n - 3)(n + 1)$ | <i>Your answer:</i> |
| What mistake has Finlay made? | |

Week 4

1.8 Starting Six



What is 35% of £150

Work out $£2.54 \times 9$

Write 110 as a product of prime factors

(a) Write 0.47 as a fraction

(b) Write $\frac{29}{5}$ as a mixed number

Solve: $\frac{x}{5} = 2\frac{1}{2}$

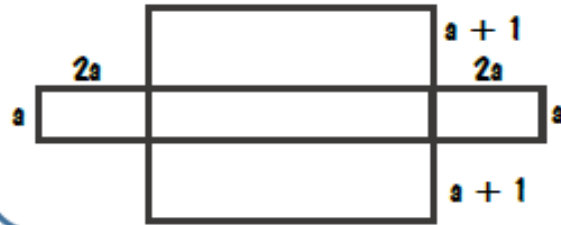
Factorise: $18 - 9m$

Solve: $9x - 10 = 3x + 8$

Factorise: $x^2 - 4x + 4$

Four numbers have a median of 4, a mean of 5 and a range of 9. The numbers are not integers. What could they be?

Shade an area represented by: $a^2 + 3a + 2$



IN A COMPANY, THE RATIO OF THE NUMBER OF MEN TO THE NUMBER OF WOMEN IS 13 : 7

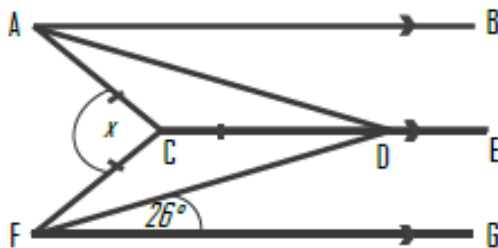
40% OF THE WOMEN ARE OVER THE AGE OF 30
40% OF THE MEN ARE UNDER THE AGE OF 30

WHAT PERCENTAGE OF PEOPLE IN THE COMPANY ARE UNDER THE AGE OF 30?

Write the number of left handed boys to girls as a ratio in its simplest form.

| | Boys | Girls |
|-------|------|-------|
| Left | 27 | 63 |
| Right | 59 | 18 |

AB, CD and FG are parallel. Work out the size of angle x .



Expand:

a) $(2a + 1)(3a - 1)$

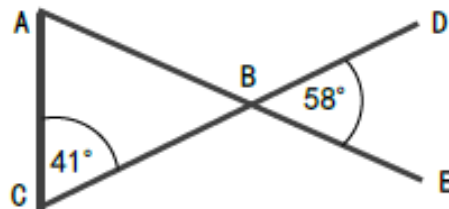
Factorise:

b) $x^2 - 25$

There are orange, yellow and blue sweets in a box. The ratio of the number of orange, yellow and blue sweets in the box is 7 : 5 : 4

What percentage of the sweets are blue?

Prove that triangle ABC is not an isosceles triangle.

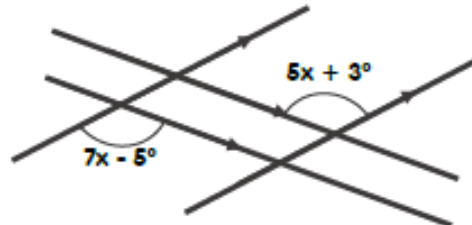


A smoothie recipe is made by mixing ice, orange and beetroot in the ratio- 2:5:1

What fraction is not equivalent to ice?

$\frac{3}{12}$ $\frac{5}{20}$ $\frac{6}{18}$ $\frac{1}{4}$

Four straight lines are shown. Work out the value of x



Week 4

Match the word with its definition

| | | |
|---------------------|--|---|
| Prism | | The connection between the sides of a right-angled triangle |
| Perimeter | | The distance around a 2D shape |
| Polygon | | A ratio out of 100 |
| Percent | | A solid object with two identical ends and flat sides |
| Pythagoras' Theorem | | A 2D shape with straight sides |

Spot the mistake

| | |
|---|---------------------|
| Question 1: Solve $x^2 - 7x + 12 = 0$. | |
| <i>Florence's answer:</i> $x^2 - 7x + 12 = 0$ Factorise: $(x - 3)(x - 4) = 0$ Answer: $x = -3 \text{ \& } -4$ | <i>Your answer:</i> |
| What mistake has Florence made? | |
| Question 2: Solve $a^2 + 5a + 3 = a - 1$. | |
| <i>Florence's answer:</i> $a^2 + 4a + 3 = -1$ Factorise: $(a + 1)(a + 3) = -1$ Answer: $a = -1 \text{ \& } -3$ | <i>Your answer:</i> |
| What mistake has Florence made? | |

Week 5

1.9 **Starting Six**



What is 35% of £85

Work out $£0.59 \times 25$

Write 104 as a product of prime factors

(a) Write 0.24 as a fraction

(b) Work out $\frac{3}{5} + \frac{2}{3}$

Solve: $\frac{x}{3} = 3\frac{1}{2}$

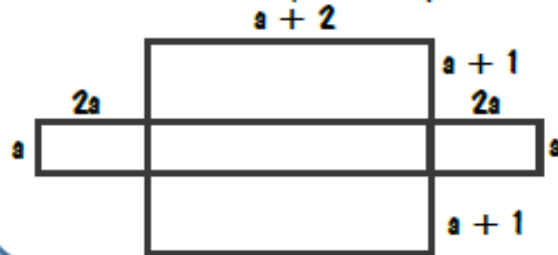
Factorise: $18m - 9$

Solve: $13x - 12 = 8x + 8$

Factorise: $x^2 - 7x - 18$

Four numbers have a median of 6, a mean of 6 and a range of 4. The numbers are not integers. What could they be?

Shade an area represented by: $4a^2$



IN A COMPANY, THE RATIO OF THE NUMBER OF MEN TO THE NUMBER OF WOMEN IS 11 : 9

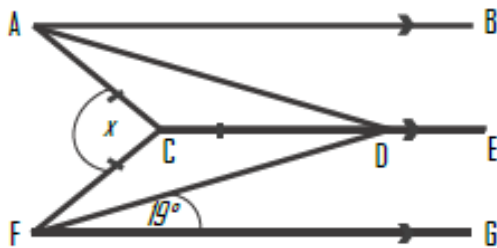
20% OF THE WOMEN ARE OVER THE AGE OF 30
80% OF THE MEN ARE UNDER THE AGE OF 30

WHAT PERCENTAGE OF PEOPLE IN THE COMPANY ARE OVER THE AGE OF 30?

Write the number of left handed girls to boys as a ratio in its simplest form.

| | Boys | Girls |
|-------|------|-------|
| Left | 39 | 26 |
| Right | 42 | 18 |

AB, CDE and FG are parallel. Work out the size of angle x .



Expand:

a) $(2a + 1)(2a - 1)$

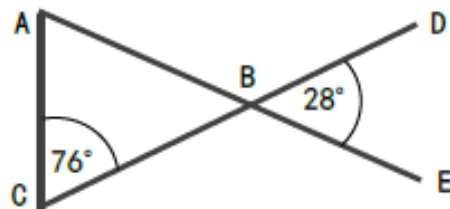
Factorise:

b) $x^2 - 49$

There are orange, yellow and blue sweets in a box. The ratio of the number of orange, yellow and blue sweets in the box is 3 : 13 : 4

What percentage of the sweets are orange?

Prove that triangle ABC is an isosceles triangle.

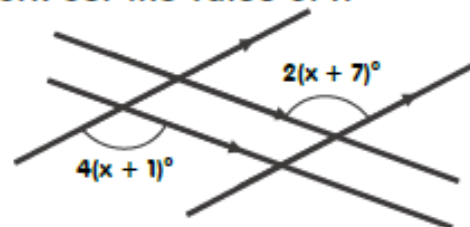


A drink recipe is made by mixing ice, apple and cinnamon in the ratio- 3:6:1

What fraction is not equivalent to apple?

$\frac{9}{15}$ $\frac{27}{45}$ $\frac{24}{35}$ $\frac{12}{18}$

Four straight lines are shown. Work out the value of x



Week 5

Match the word with its definition

| | | |
|----------------|--|--|
| Radius | | The difference between the lowest and highest values |
| Counterexample | | Make a number simpler but keeping its value close to what it was |
| Circumference | | The distance from the centre to the circumference of a circle |
| Round | | The distance around the edge of a circle |
| Range | | An example that disproves a statement |

Spot the mistake

| | |
|--|--|
| <p>Question 1: Solve $2y^2 - 7y + 3 = 0$</p> | |
| <p><i>Florence's answer:</i> $2y^2 - 7y + 3 = 0$ Factorise: $(2y - 1)(y - 3) = 0$ Answer: $y = 1 \text{ \& } 3$</p> | <p style="text-align: center;"><i>Your answer:</i></p> |
| <p><i>What mistake has Florence made?</i></p> | |
| <p>Question 2: Solve $3x^2 + 5x - 4 = 0$ giving your answers to 3sf.</p> | |
| <p><i>Florence's answer:</i> $3x^2 + 5x - 4 = 0$ Use the quadratic formula: $x = \frac{5 \pm \sqrt{5^2 - 4 \times 3 \times -4}}{2 \times 3}$ $x = \frac{5 \pm \sqrt{73}}{6}$ Answer: $x = 2.26 \text{ \& } -0.591$</p> | <p style="text-align: center;"><i>Your answer:</i></p> |
| <p><i>What mistake has Florence made?</i></p> | |

Week 6

2.0 **Starting Six**



What is 45% of £130

Work out $£2.59 \times 17$

Write 360 as a product of prime factors

(a) Write 0.201 as a fraction

(b) Work out $\frac{8}{9} \times \frac{2}{5}$

Solve: $4x + 9 = 21$

Factorise: $12y - 18$

Solve: $16x + 4 = 8x + 8$

Factorise: $x^2 - 13x + 22$

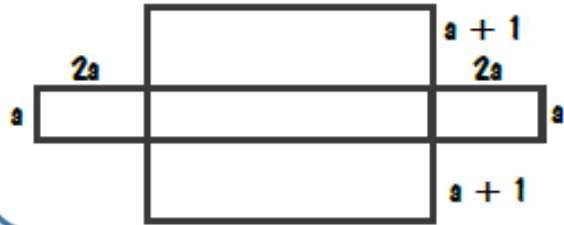
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Top Ten Topics



Four numbers have a median of 6, a mean of 6 and a range of 1. The numbers are not integers. What could they be?

Shade an area represented by: $a^2 + 2a$



IN A COMPANY, THE RATIO OF THE NUMBER OF MEN TO THE NUMBER OF WOMEN IS 11 : 9

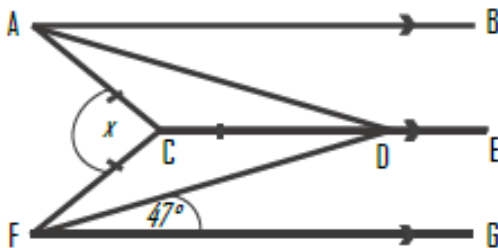
20% OF THE WOMEN ARE UNDER THE AGE OF 30
80% OF THE MEN ARE OVER THE AGE OF 30

WHAT PERCENTAGE OF PEOPLE IN THE COMPANY ARE OVER THE AGE OF 30?

Write the number of left handed girls to boys as a ratio in its simplest form.

| | Boys | Girls |
|-------|------|-------|
| Left | 59 | 48 |
| Right | 21 | 34 |

AB, CDE and FG are parallel. Work out the size of angle x .



Expand:

a) $(3a + 2)(3a - 2)$

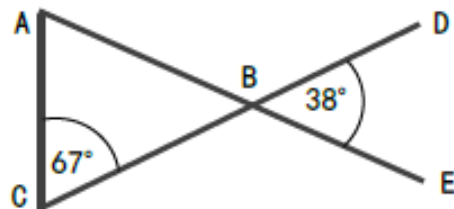
Factorise:

b) $x^2 - 81$

There are orange, yellow and blue sweets in a box. The ratio of the number of orange, yellow and blue sweets in the box is 3 : 7 : 4

What is the probability of picking a yellow sweet?

Prove that triangle ABC is a scalene triangle.

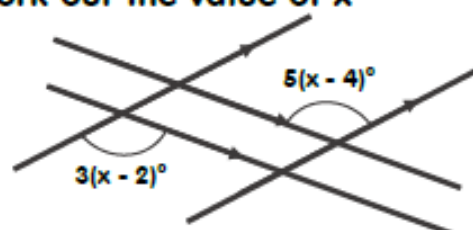


A drink is made by mixing coffee, sugar syrup and cream in the ratio- 2:4:1

What fraction is equivalent to coffee?

$\frac{16}{54}$ $\frac{12}{26}$ $\frac{20}{35}$ $\frac{2}{6}$

Four straight lines are shown. Work out the value of x



Week 6

Match the word with its definition

| | | |
|---------------|--|--|
| Ratio | | A value when multiplied by itself gives the number |
| Square number | | How steep a line is |
| Scale | | The relative sizes of two or more values |
| Gradient | | The result of multiplying an integer by itself |
| Square root | | The ratio of the length in a drawing to the length on the real thing |

Spot the mistake

| | |
|--|---------------------|
| Question 1: Evaluate $16^{\frac{1}{2}}$. | |
| <i>Izzy's answer:</i> | <i>Your answer:</i> |
| $16^{\frac{1}{2}}$ means I halve 16. Answer: 8 | |
| <i>What mistake has Izzy made?</i> | |
| Question 2: Evaluate 9^{-2} . | |
| <i>Izzy's answer:</i> | <i>Your answer:</i> |
| 9^{-2} means I square root 9. Answer: 3 | |
| <i>What mistake has Izzy made?</i> | |