



Corbettmaths

Ultimate  
CCEA M7  
Revision  
Question Booklet

Revision Video



Answers



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## Laws of Indices - Video 174

1. Simplify  $w^{-4} \times w^7$

$$w^3$$

2. Simplify  $\frac{w^5}{w^{-8}}$

$$w^{13}$$

3. Simplify  $(w^4)^{-5}$

$$w^{-20}$$

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## Simultaneous Equations - Video 295

4. Solve the simultaneous equations

$$\begin{array}{r} 2x + 4y = 26 \quad - (1) \\ 3x - y = 4 \quad - (2) \end{array}$$

$$4 \times (2)$$

$$\begin{array}{r} 12x - 4y = 16 \\ \text{add } 2x + 4y = 26 \\ \hline 14x = 42 \\ x = 3 \end{array}$$

$$9 - y = 4$$

$$9 = 4 + y$$

$$-4 \quad -4$$

$$5 = y$$

$$y = 5$$

$$6 + 20 = 26 \quad \checkmark$$

$$x = \underline{\quad 3 \quad} \quad y = \underline{\quad 5 \quad}$$

5. Solve the simultaneous equations

$$\begin{array}{r} 3x + 2y = 16 \quad - \textcircled{1} \\ 2x - 3y = 2 \quad - \textcircled{2} \end{array}$$

$$\begin{array}{r} 12 + 2y = 16 \\ 2y = 4 \\ y = 2 \end{array}$$

$$8 - 6 = 2 \checkmark$$

$$\begin{array}{r} 3 \times \textcircled{1} \quad 9x + 6y = 48 \\ 2 \times \textcircled{2} \quad 4x - 6y = 4 \\ \hline \text{add} \quad 13x = 52 \\ x = 4 \end{array}$$

$$x = \dots\dots\dots 4 \dots\dots\dots \quad y = \dots\dots\dots 2 \dots\dots\dots$$

6. Three bananas and two pears cost 95p.  
Five bananas and three pears cost £1.51

Find the cost of ten bananas and ten pears.

$$\begin{array}{r} 3x + 2y = 95 \quad - \textcircled{1} \\ 5x + 3y = 151 \quad - \textcircled{2} \end{array}$$

$$\begin{array}{r} 3 \times \textcircled{1} \quad 9x + 6y = 285 \\ 2 \times \textcircled{2} \quad 10x + 6y = 302 \\ \hline \text{sub} \quad 9x + 6y = 285 \\ \hline x = 17 \end{array}$$

$$10 \times 17 = \pounds 1.70$$

$$10 \times 22 = \pounds 2.20$$

$$\begin{array}{r} 51 + 2y = 95 \\ 2y = 44 \\ y = 22 \end{array}$$

$$\pounds \dots\dots\dots 3.90 \dots\dots\dots$$

## Changing the Subject - Videos 7, 8

7. Make  $w$  the subject of the formula  $4(g + w) = 9w - 3$

$$4g + 4w = 9w - 3$$

$$\phantom{4g} - 4w \quad - 4w$$

$$4g = 5w - 3$$

$$+3 \quad +3$$

$$4g + 3 = 5w$$

$$\div 5 \quad \div 5$$

$$\frac{4g+3}{5} = w$$

$$w = \frac{4g+3}{5}$$

8. Make  $v$  the subject of  $s = \frac{1}{2}(u + v)t$

$$2s = (u + v)t$$

$$2s = ut + vt$$

$$2s - ut = vt$$

$$\div t \quad \div t$$

$$\frac{2s - ut}{t} = v$$

$$v = \frac{2s - ut}{t}$$

## nth term (non linear) - Video 289

9. Find the  $n$ th term of  $\frac{9}{10}, \frac{11}{20}, \frac{13}{30}, \dots$

	9	11	13		10	20	30
$2n$	2	4	6		10n	20	30
	$2n + 7$				$10n$		

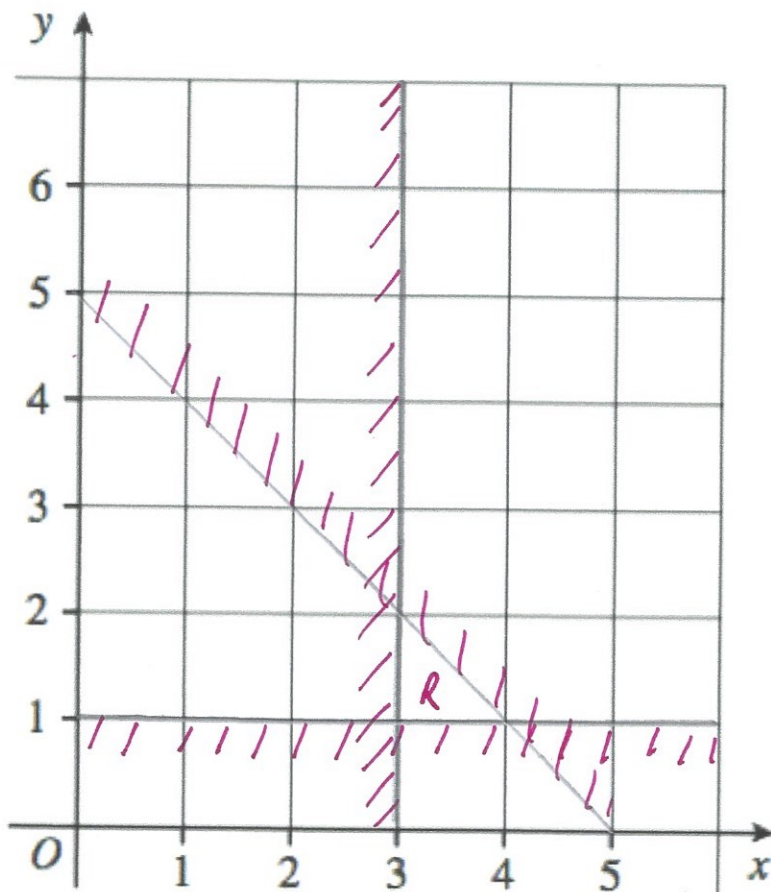
$$\frac{2n+7}{10n}$$

## Graphical Inequalities - Video 182

10. On the grid, clearly indicate the region that satisfies all these inequalities.

$$x \geq 3 \quad y \geq 1 \quad x + y \leq 5$$

$$0+0 \leq 5 \quad \checkmark$$

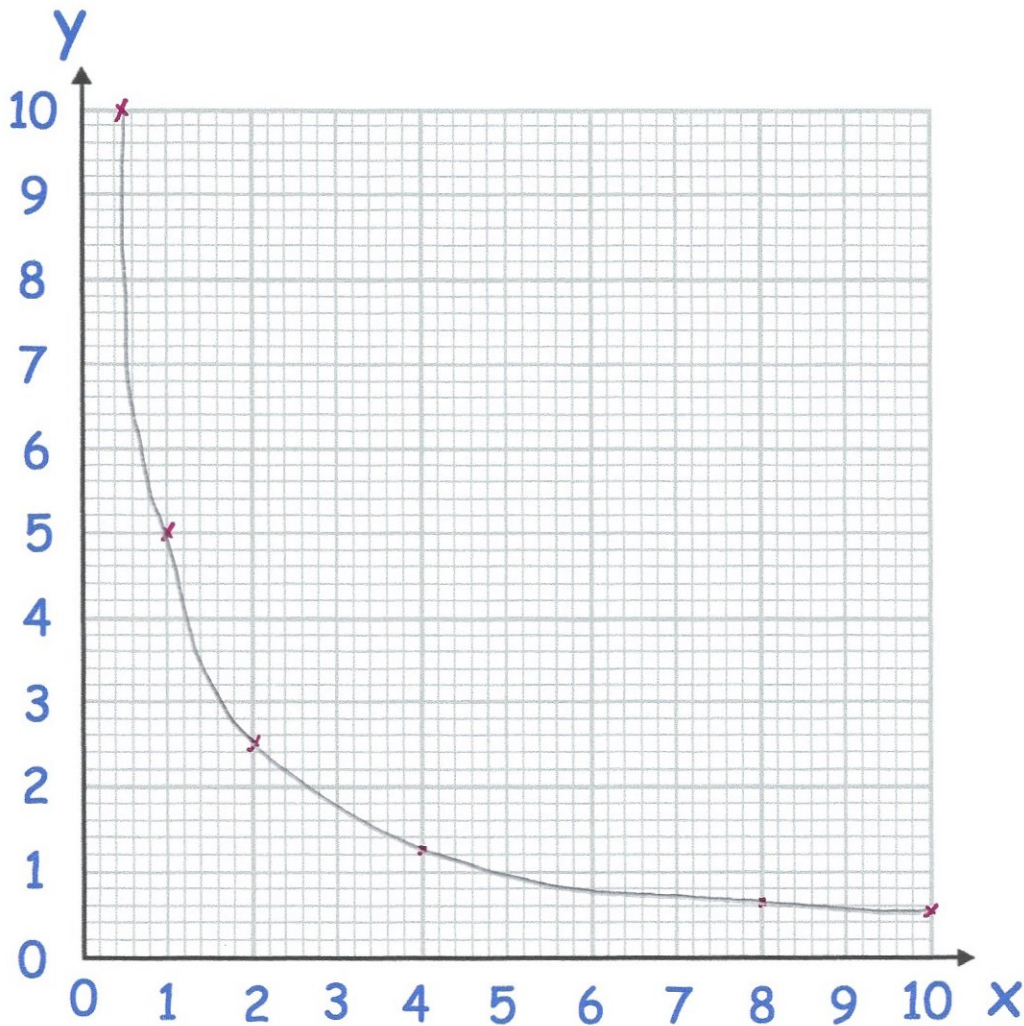


### Reciprocal Graphs - Video 346

11. Complete the table of values for  $y = \frac{5}{x}$

x	0.5	1	2	4	8	10
y	10	5	2.5	1.25	0.625	0.5

12. On the grid, draw the graph of  $y = \frac{5}{x}$  for  $0.5 \leq x \leq 10$

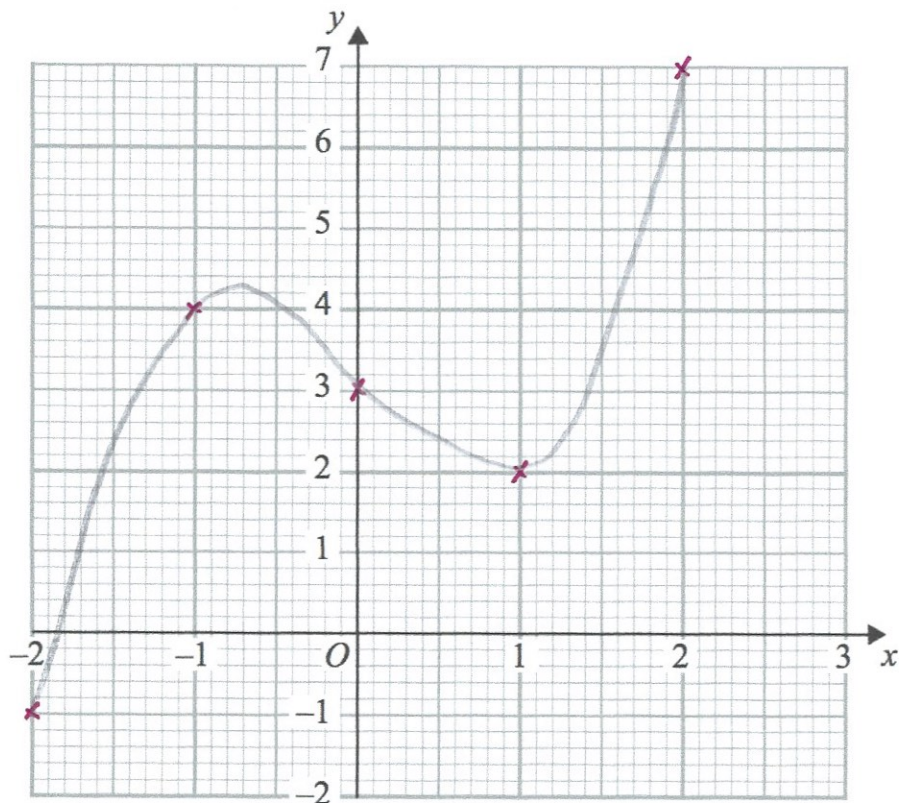


## Cubic Graphs - Video 344

13. Complete the table of values for  $y = x^3 - 2x + 3$

x	-2	-1	0	1	2
y	-1	4	3	2	7

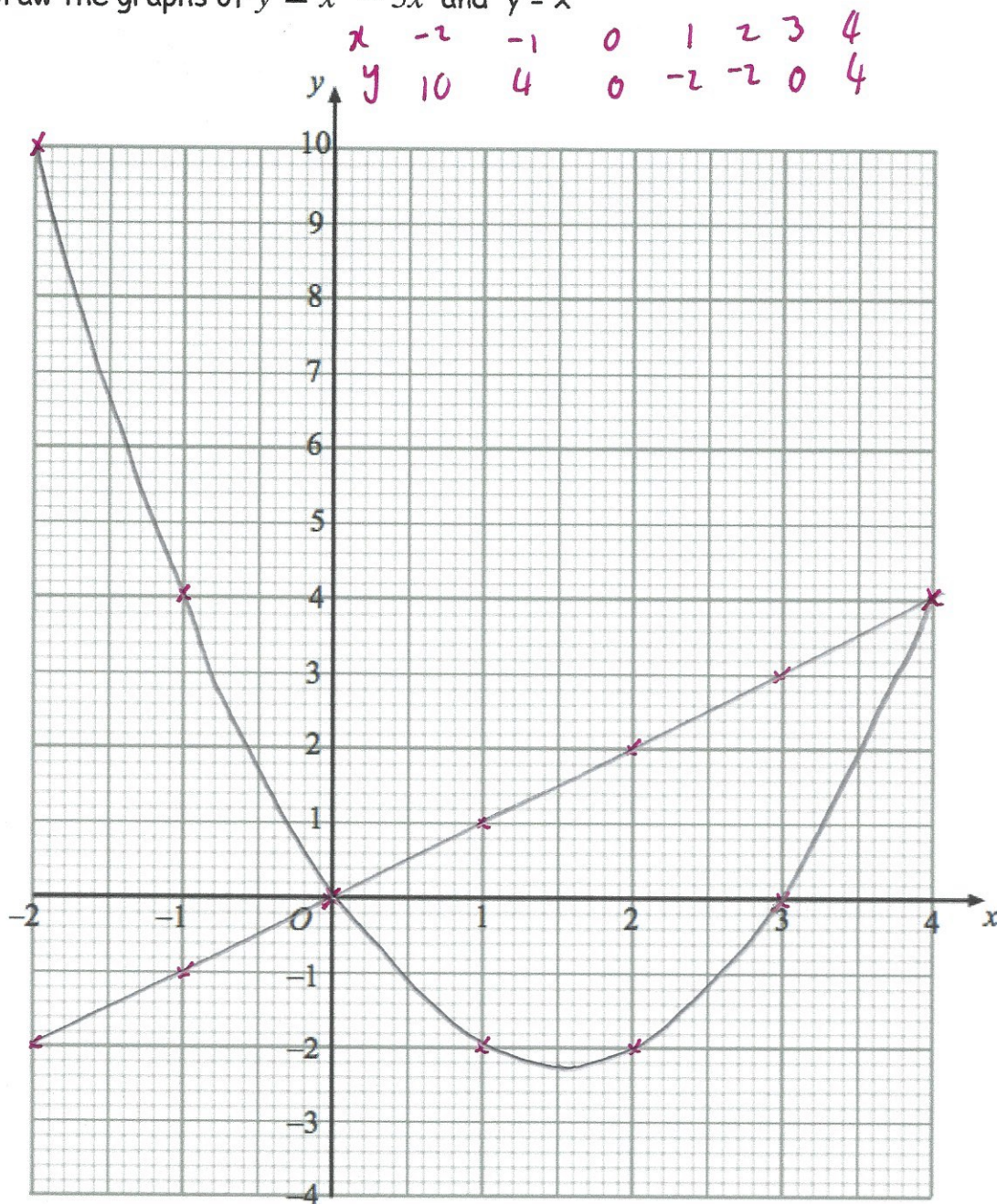
14. On the grid, draw the graph of  $y = x^3 - 2x + 3$  for  $-2 \leq x \leq 2$





## Quadratic Graphs - Video 267c, 267d

15. Draw the graphs of  $y = x^2 - 3x$  and  $y = x$



16. Write down the coordinates of where  $y = x^2 - 3x$  and  $y = x$  intersect.

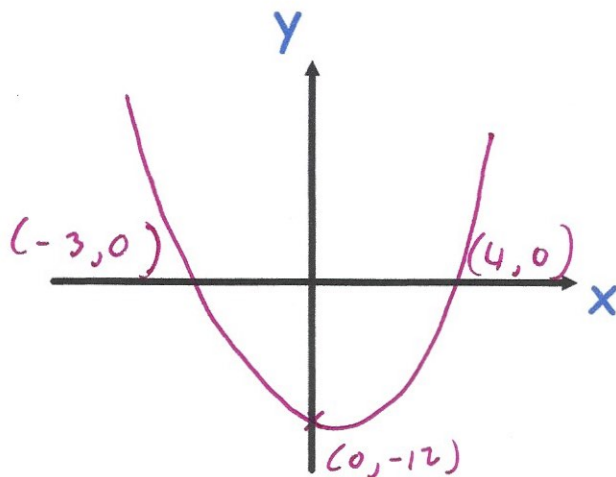
$(0, 0)$  e  $(4, 4)$

## Sketching Quadratics - Video 265

17. Sketch the graph of  $y = x^2 - x - 12$  below.  
Clearly show where the graph meets the x-axis and y-axis.

$$0^2 - 0 - 12 = -12$$

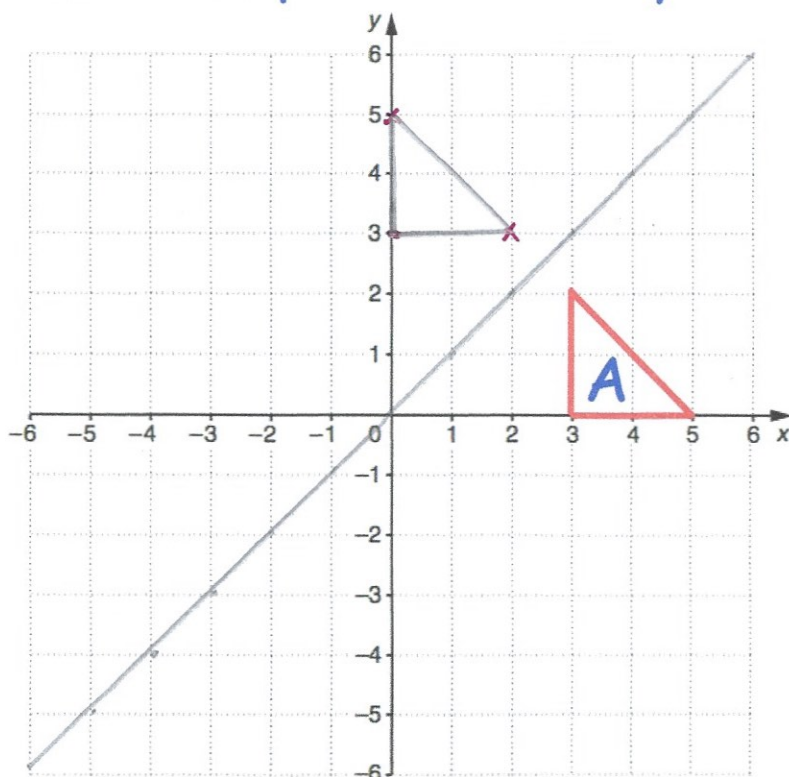
$$(x - 4)(x + 3) = 0$$
$$x = 4 \text{ or } x = -3$$



## Reflections - Video 272

- 18.

Reflect shape A in the line  $y = x$

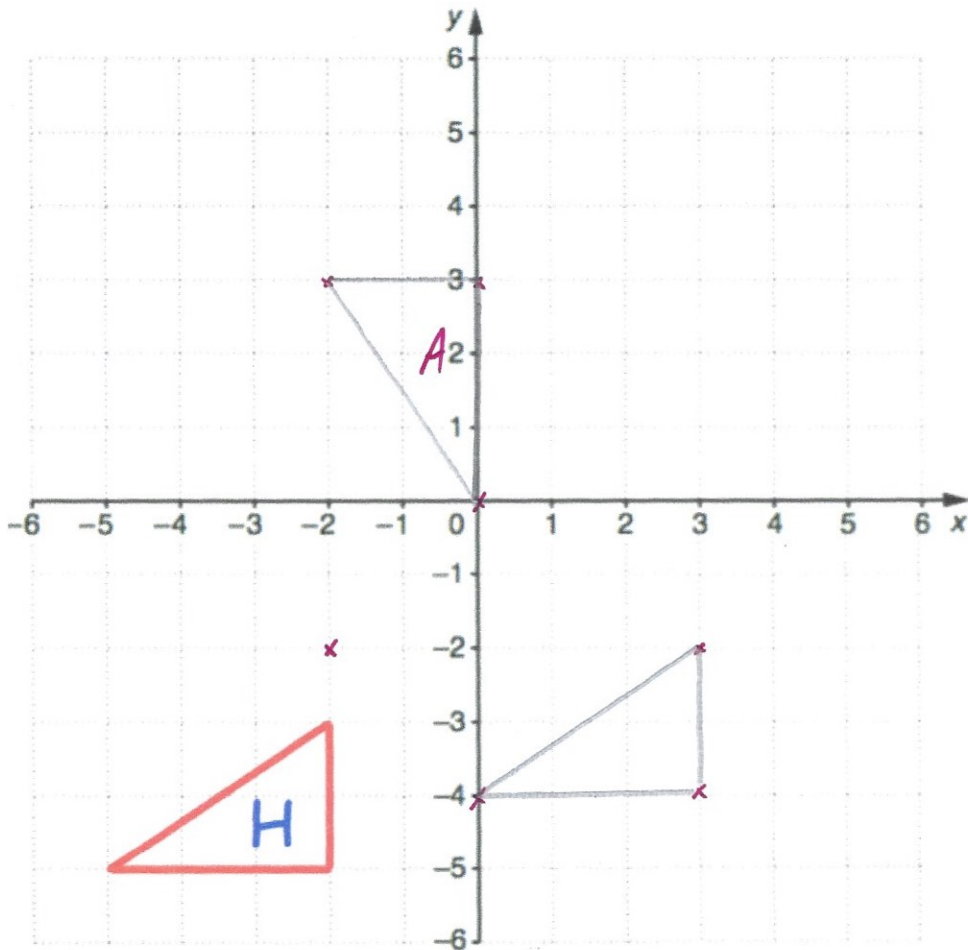


## Combined Transformations - Videos 275, 325

19. Triangle H is translated by the vector  $\begin{pmatrix} 5 \\ 1 \end{pmatrix}$  *right*  
*up*

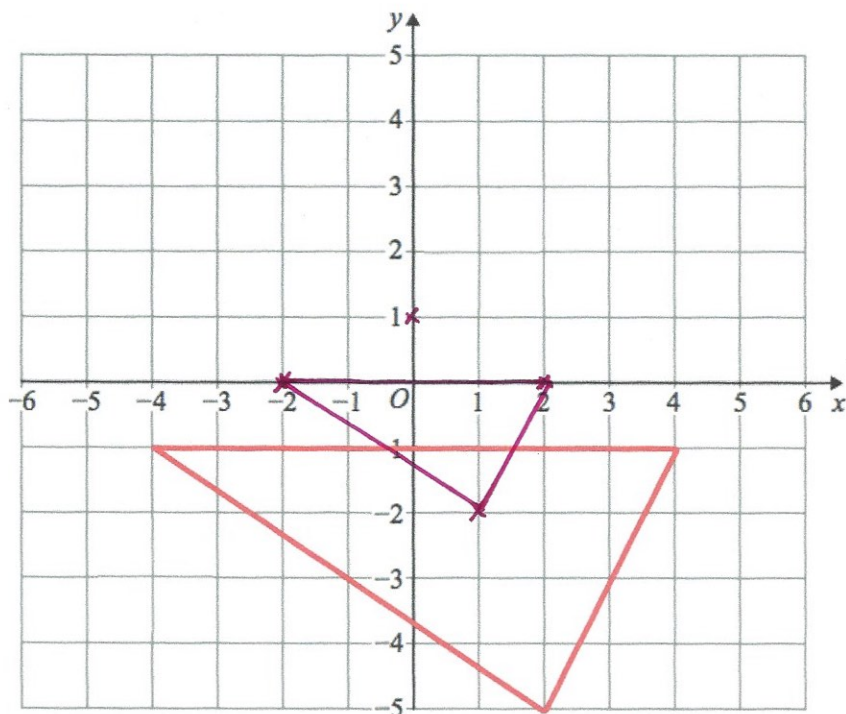
and the image is then rotated  $90^\circ$  anticlockwise about  $(-2, -2)$

Draw the final image and label it A.



Enlargements - Videos 104, 104a

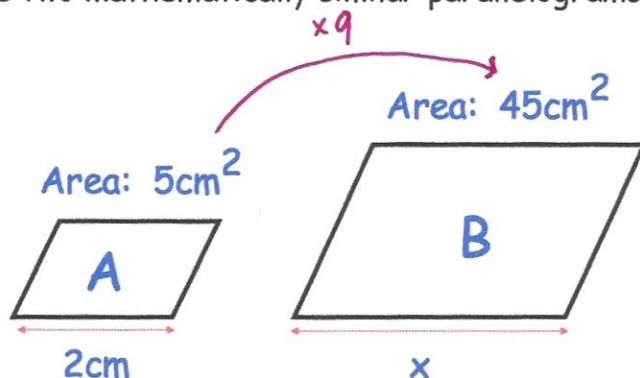
20.



Enlarge by scale factor  $\frac{1}{2}$  using  $(0, 1)$  as the centre of enlargement

Similar Shapes - Videos 292, 293

21. Shown below are two mathematically similar parallelograms.

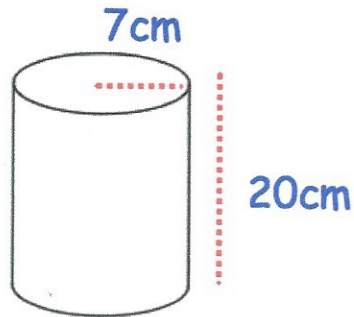


Find x

.....<sup>6</sup>.....cm

Circles (in terms of pi) - Video 63a

22. Find the volume of the cylinder.  
Give your answer in terms of  $\pi$



$$\pi \times 7^2 \times 20$$

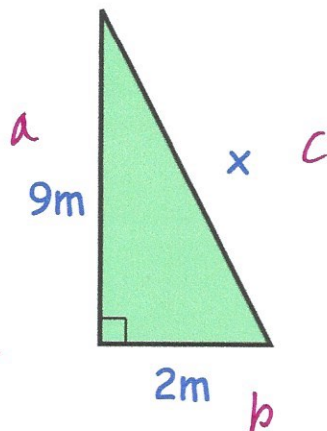
$$\pi \times 49 \times 20$$

$$980\pi \text{ cm}^3$$

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Pythagoras (exact) - Video 261a

23. Work out the size of  $x$ .  
Write your answer in surd form.



$$a^2 + b^2 = c^2$$

$$9^2 + 2^2 = x^2$$

$$81 + 4 = x^2$$

$$85 = x^2$$

$$\sqrt{85}$$

.....m

## Product Rule for Counting - Video 383

At Corbett's Cafe there are

- 7 starters
- 16 main dishes
- 11 desserts

A meal voucher allows a customer to pick one starter, one main dish and one dessert for £10

24. How many different ways are there to choose a meal?

$$7 \times 16 \times 11$$

1232

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Three of the starters and four of the main dishes contain fish.  
A different customer uses their meal voucher but they do not like fish.

25. How many different meal combinations can they choose?

$$7 - 3 = 4$$
$$16 - 4 = 12$$

$$4 \times 12 \times 11$$

528

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## Independent Events - Video 249

26. Jackson and Kelvin each sit a test.

The probability that Jackson passes is 0.8  
The probability that Kelvin passes is 0.6

Find the probability that both of them pass.

$$0.8 \times 0.6$$

0.48

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## Negative Indices - Video 175

31. Work out  $5^{-2}$

$$\frac{1}{5^2}$$

$$\frac{1}{25}$$

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32. Work out  $10^{-3}$

$$\frac{1}{10^3}$$

$$\frac{1}{1000}$$

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## Standard Form - Videos 300, 301, 302, 303

33. Write 700000 in standard form

$$7 \times 10^5$$

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34. Write 28000 in standard form

$$2.8 \times 10^4$$

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35. Write 0.094 in standard form

$$9.4 \times 10^{-2}$$

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36. Write  $1.7 \times 10^4$  as an ordinary number

17000

37. Write  $9.2 \times 10^{-3}$  as an ordinary number.

0.0092

38. Write  $450 \times 10^5$  in standard form.

$4.5 \times 10^7$

39. Work out  $(3.8 \times 10^5) + (1.9 \times 10^6)$

$$\begin{array}{r} 1900000 \\ + 380000 \\ \hline 2280000 \end{array}$$

$2.28 \times 10^6$

40. Work out  $(6 \times 10^3) \times (4 \times 10^5)$   
Give your answer in standard form.

$$24 \times 10^8$$
$$2.4 \times 10^9$$

$$2.4 \times 10^9$$

41. Work out  $(4 \times 10^9) \div (5 \times 10^{-2})$   
Give your answer in standard form.

$$0.8 \times 10^{11}$$

$$8 \times 10^{10}$$

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### Direct Proportion - Video 254

H is directly proportional to the cube of c.  
When  $H = 40$ ,  $c = 2$ .

42. Express H in terms of c.

$$H \propto c^3$$

$$H = kc^3$$

$$40 = k \times 2^3$$

$$40 = k \times 8$$

$$k = 5$$

$$H = 5c^3$$

43. Find the value of H when  $c = 5$

$$H = 5 \times 5^3$$

$$625$$