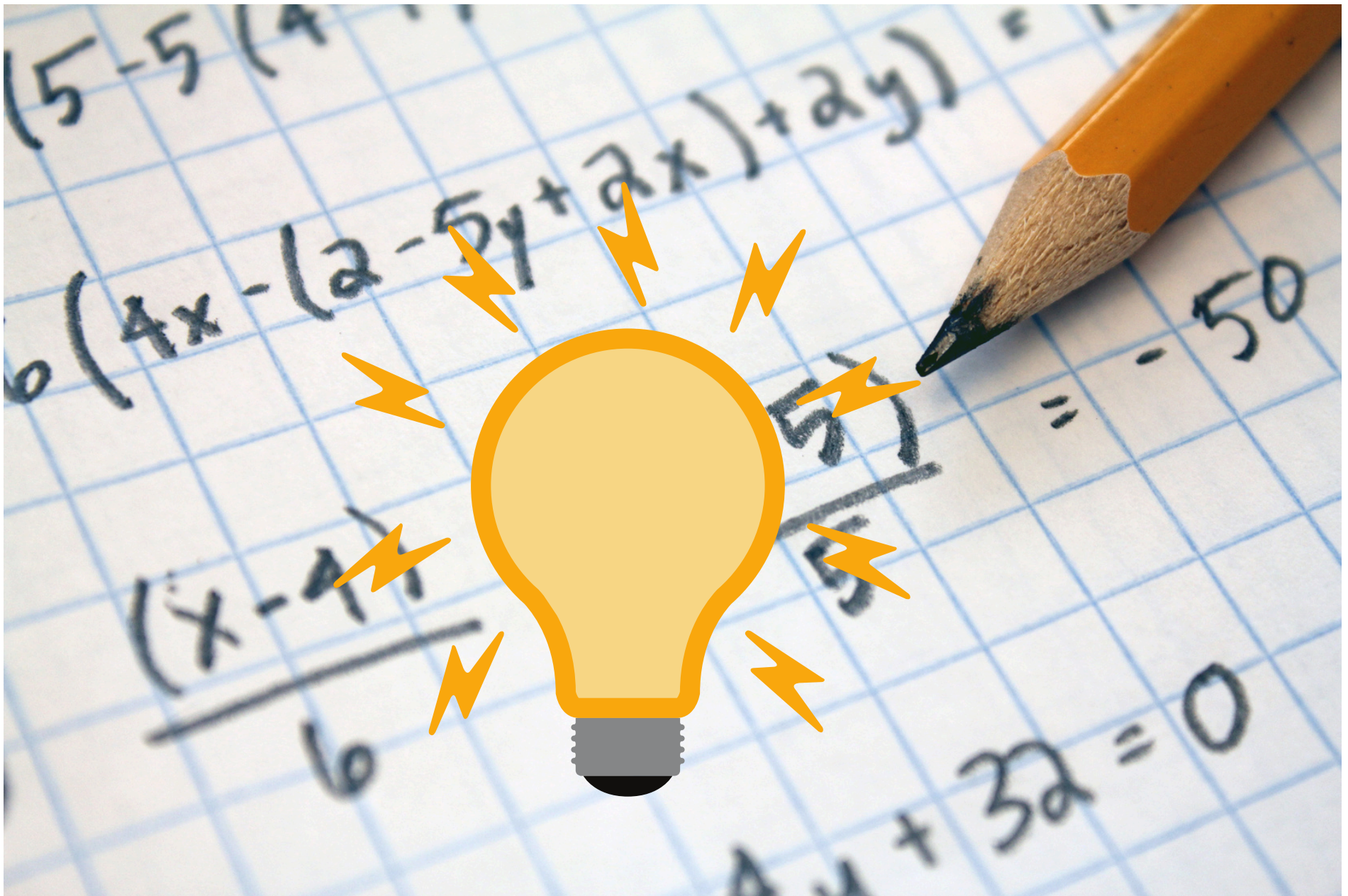


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ALGEBRA



An introduction to algebraic skills.

Suitable for Year 5 & 6



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Session 1

An introduction
to the basics
of algebra

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CONTENTS

Session 1: Introduction to algebraic concepts and common rules & answers

Session 2: Find n (addition and subtraction) & answers

Session 3: Find n (multiplication and division) & answers

Session 4: Find n (multi-step) & answers

Session 5: Algebraic puzzles part 1 & answers

Session 6: Algebraic puzzles part 2 & answers

Click the video icon to open the lesson video



$$x^2 + b^2 = c^2$$

$$S = \int_0^2 5t dt$$

$$\sin a = \frac{b}{c}$$

$$1 - \tan^2(a)$$

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Session 1: an introduction



Practice section: **if $n = 3$**

1) $4n =$

2) $3n + 5 =$

3) $4n - 6$

4) $n^2 + 8 =$

Have a go! **if $n = 5$**

1) $3n =$

2) $7n =$

3) $100n =$

4) $6n + 8 =$

5) $8n + 6 =$

6) $20n + 12 =$

7) $8n - 12 =$

7) $9n - 20 =$

9) $20n - 12 =$

10) $n^2 + 8 =$

11) $n^2 - 8 =$

12) $n^3 - 100 =$

Challenge **if $x = 6$ and $y = 8$**

1) $3x - y =$

2) $2y - x =$

3) $3x - 2y =$

4) $2y - 2x =$

5) $5 + xy =$

6) $xy - 5 =$



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Session 1: ANSWERS



Practice section: **if $n = 3$**

1) $4n = 12$

2) $3n + 5 = 14$

3) $4n - 6 = 6$

4) $n^2 + 8 = 17$

Have a go! **if $n = 5$**

1) $3n = 15$

2) $7n = 35$

3) $100n = 500$

4) $6n + 8 = 38$

5) $8n + 6 = 46$

6) $20n + 12 = 112$

7) $8n - 12 = 28$

7) $9n - 20 = 25$

9) $20n - 12 = 88$

10) $n^2 + 8 = 33$

11) $n^2 - 8 = 17$

12) $n^3 - 100 = 25$

Challenge **if $x = 6$ and $y = 8$**

1) $3x - y = (3 \times 6) - 8 = 10$

2) $2y - x = (2 \times 8) - 6 = 10$

3) $3x - 2y = (3 \times 6) - (2 \times 8) = 2$

4) $2y - 2x = (2 \times 8) - (2 \times 6) = 4$

5) $5 + xy = 5 + (6 \times 8) = 53$

6) $xy - 5 = (6 \times 8) - 5 = 43$

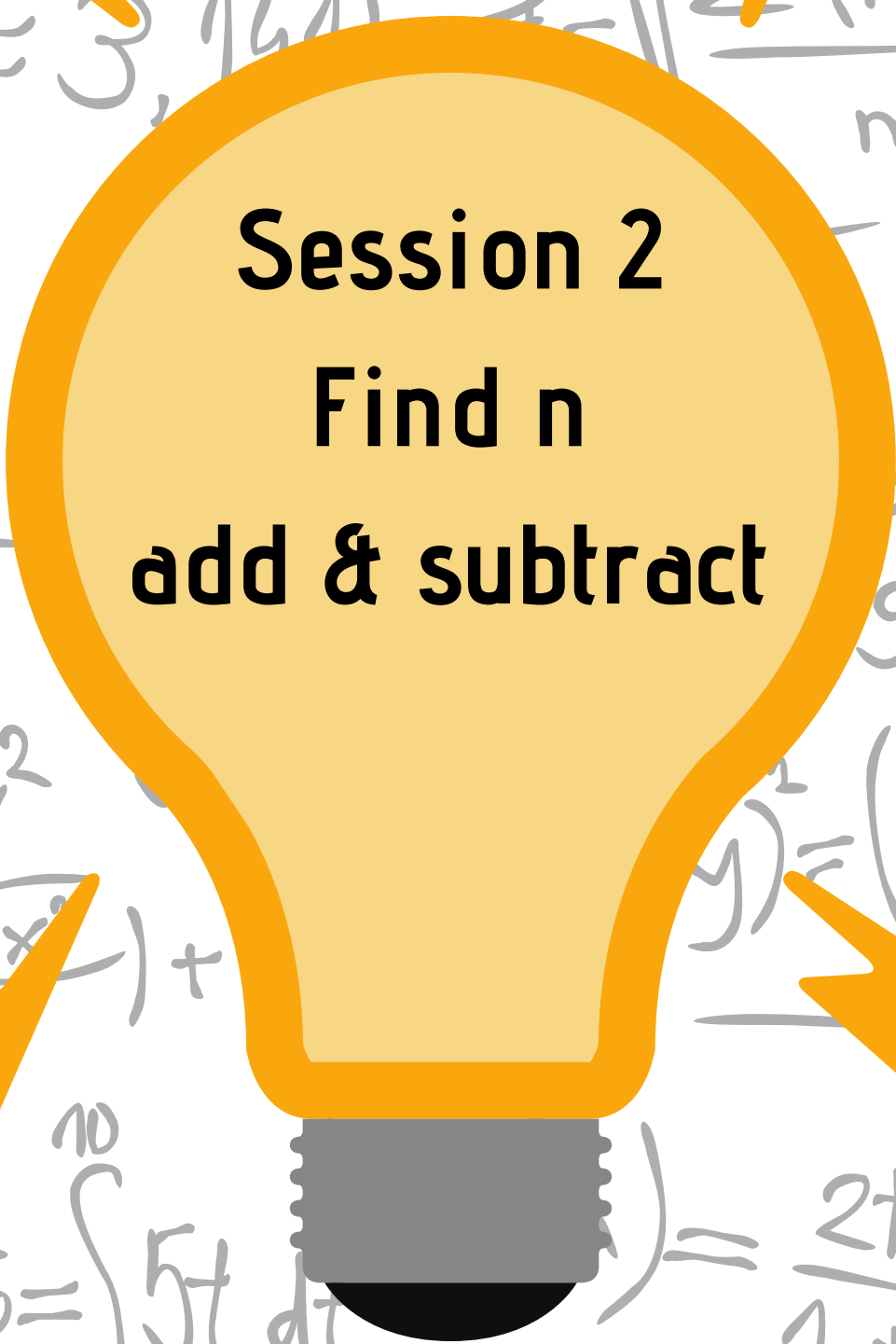


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Session 2
Find n
add & subtract

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Session 2: Find n (add & subtract)



Practice section: Find n

$$1) n + 29 = 65 \quad n =$$

$$2) 18 + n = 56 \quad n =$$

$$3) 48 - n = 27 \quad n =$$

$$4) n - 23 = 55 \quad n =$$

$$5) n^2 + 10 = 35 \quad n =$$

$$6) 50 - n^2 = 14 \quad n =$$

Have a go! Find n

$$1) n + 43 = 99 \quad n =$$

$$2) n + 26 = 52 \quad n =$$

$$3) n + 16 = 87 \quad n =$$

$$4) 21 + n = 32 \quad n =$$

$$5) 19 + n = 66 \quad n =$$

$$6) 49 + n = 75 \quad n =$$

$$7) 100 - n = 64 \quad n =$$

$$7) 83 - n = 28 \quad n =$$

$$9) 112 - n = 99 \quad n =$$

$$10) n - 16 = 85 \quad n =$$

$$11) n - 101 = 102 \quad n =$$

$$12) n - 49 = 49 \quad n =$$

Challenge Find n

$$1) n^2 + 20 = 24 \quad n =$$

$$2) n^2 - 18 = 63 \quad n =$$

$$3) 100 - n^2 = 91 \quad n =$$

$$4) n^3 + 26 = 34 \quad n =$$

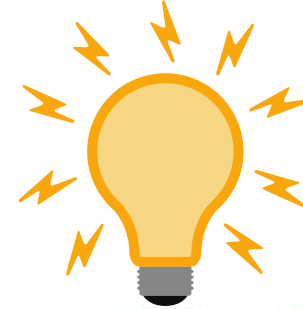
$$5) n^3 - 100 = 900 \quad n =$$

$$6) 100 - n^3 = 73 \quad n =$$



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Session 2: ANSWERS



Practice section: Find n

$$1) n + 29 = 65 \quad n = 36$$

$$2) 18 + n = 56 \quad n = 38$$

$$3) 48 - n = 27 \quad n = 21$$

$$4) n - 23 = 55 \quad n = 78$$

$$5) n^2 + 10 = 35 \quad n = 5$$

$$6) 50 - n^2 = 14 \quad n = 6$$

Have a go! Find n

$$1) n + 43 = 99 \quad n = 56 \quad 2) n + 26 = 52 \quad n = 26 \quad 3) n + 16 = 87 \quad n = 71$$

$$4) 21 + n = 32 \quad n = 11 \quad 5) 19 + n = 66 \quad n = 47 \quad 6) 49 + n = 75 \quad n = 26$$

$$7) 100 - n = 64 \quad n = 36 \quad 7) 83 - n = 28 \quad n = 55 \quad 9) 112 - n = 99 \quad n = 13$$

$$10) n - 16 = 85 \quad n = 101 \quad 11) n - 101 = 102 \quad n = 203 \quad 12) n - 49 = 49 \quad n = 98$$

Challenge Find n

$$1) n^2 + 20 = 24 \quad n = 2$$

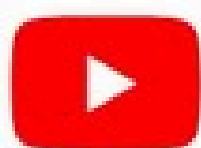
$$2) n^2 - 18 = \quad n = 9$$

$$3) 100 - n^2 = 91 \quad n = 3$$

$$4) n^2 + 26 = 34 \quad n = 2$$

$$5) n^3 - 100 = 900 \quad n = 10$$

$$6) 100 - n^3 = 73 \quad n = 3$$

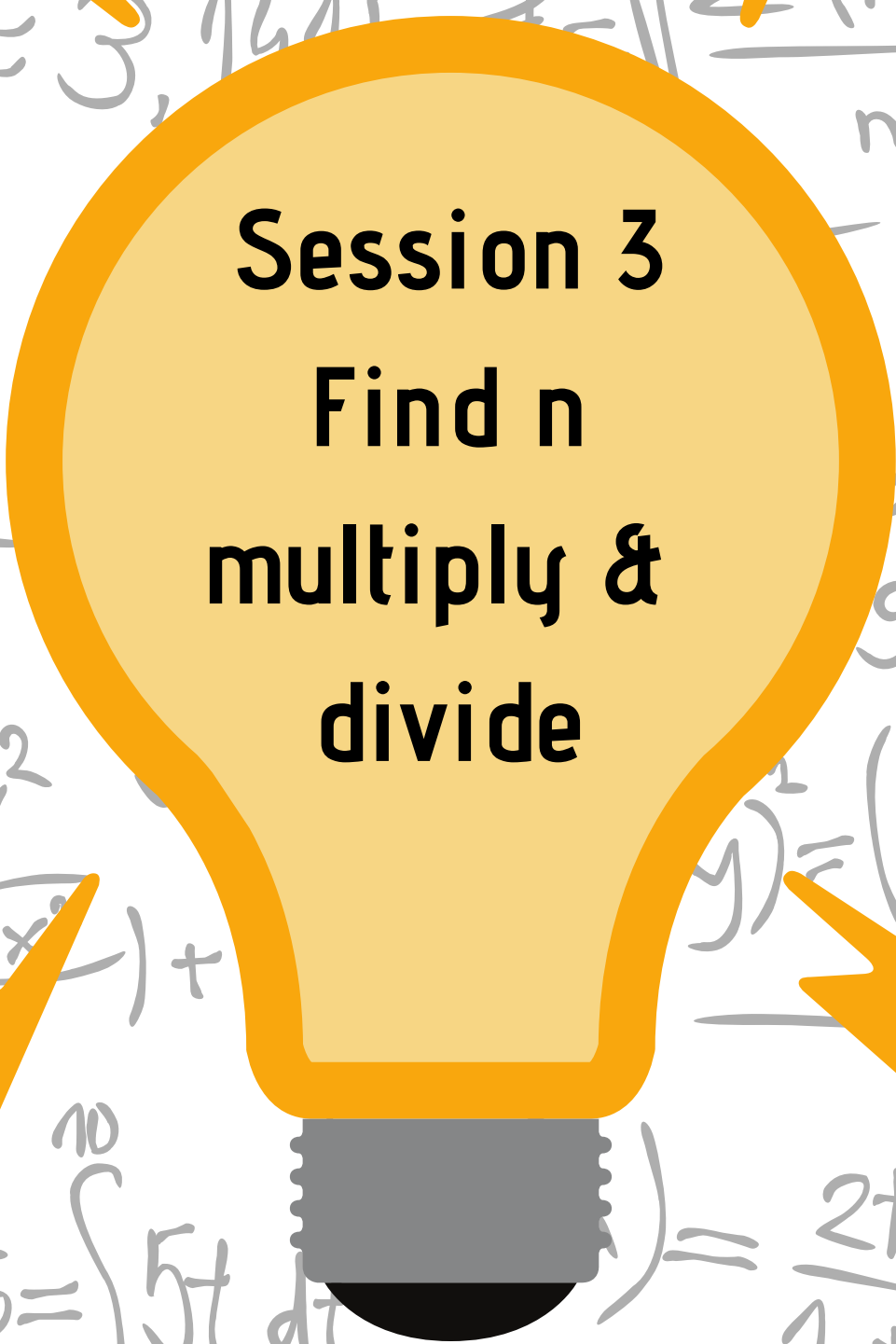


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Session 3
Find n
multiply &
divide

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Session 3: Find n (multiply & divide)



Practice section: **Find n**

1) $5n = 30$ **n =**

2) $11n = 66$ **n =**

3) $48 \div n = 12$ **n =**

4) $n \div 5 = 20$ **n =**

5) $3n^2 = 12$ **n =**

6) $72 \div n^2 = 8$ **n =**

Have a go! **Find n**

1) $9n = 99$ **n =**

2) $7n = 84$ **n =**

3) $6n = 42$ **n =**

4) $21n = 63$ **n =**

5) $18n = 36$ **n =**

6) $25n = 100$ **n =**

7) $100 \div n = 10$ **n =**

7) $81 \div n = 9$ **n =**

9) $132 \div n = 11$ **n =**

10) $n \div 6 = 8$ **n =**

11) $n \div 8 = 12$ **n =**

12) $n \div 11 = 11$ **n =**

Challenge **Find n**

1) $5n^2 = 45$ **n =**

2) $3n^2 = 75$ **n =**

3) $3n^3 = 24$ **n =**

4) $n^3 \div 5 = 200$ **n =**

5) $100 \div n^2 = 4$ **n =**

6) $n^3 \div 4 = 16$ **n =**



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Session 3: ANSWERS



Practice section: Find n

1) $5n = 30$ n = 6

2) $11n = 66$ n = 6

3) $48 \div n = 12$ n = 4

4) $n \div 5 = 20$ n = 100

5) $3n^2 = 12$ n = 2

6) $72 \div n^2 = 8$ n = 3

Have a go! Find n

1) $9n = 99$ n = 11

2) $7n = 84$ n = 12

3) $6n = 42$ n = 7

4) $21n = 63$ n = 3

5) $18n = 36$ n = 2

6) $25n = 100$ n = 4

7) $100 \div n = 10$ n = 10

7) $81 \div n = 9$ n = 9

9) $132 \div n = 11$ n = 12

10) $n \div 6 = 8$ n = 48

11) $n \div 8 = 12$ n = 96

12) $n \div 11 = 11$ n = 121

Challenge Find n

1) $5n^2 = 45$ n = 3

2) $3n^2 = 75$ n = 5

3) $3n^3 = 24$ n = 2

4) $n^3 \div 5 = 200$ n = 10

5) $100 \div n^2 = 4$ n = 5

6) $n^3 \div 4 = 16$ n = 4



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Session 4
Find n
with multi-step
expressions

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Session 4: Find n (multi-step)



Practice section: Find n

1) $3n + 18 = 36$

n =

2) $4n - 8 = 32$

n =

3) $100 - 5n = 60$

n =

4) $\frac{15}{n} + 6 = 11$

n =

5) $80 - \frac{42}{n} = 73$

n =

6) $\frac{n}{10} + 6 = 15$

n =

7) $2n^2 - 12 = 20$

n =

8) $\frac{n^2}{5} + 15 = 35$

n =

Have a go! Find n

1) $6n - 7 = 47$ **n =**

2) $5n + 13 = 58$ **n =**

3) $9n + 18 = 54$ **n =**

4) $55 - 3n = 22$ **n =**

5) $78 - 7n = 1$ **n =**

6) $10 + 8n = 74$ **n =**

7) $81 - 5n = 46$ **n =**

7) $11n - 50 = 27$ **n =**

9) $\frac{20}{n} + 16 = 21$ **n =**

10) $100 - \frac{56}{n} = 93$ **n =**

11) $\frac{n}{9} + 66 = 69$ **n =**

12) $\frac{n}{5} + 16 = 20$ **n =**

Challenge Find n

1) $3n^2 - 60 = 15$ **n =**

2) $81 - 4n^2 = 65$ **n =**

3) $\frac{n^2}{9} + 16 = 20$ **n =**

4) $\frac{75}{n^2} + 7 = 10$ **n =**



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Session 4: ANSWERS



Practice section: Find n

1) $3n + 18 = 36$	$n = 6$	2) $4n - 8 = 32$	$n = 10$
3) $100 - 5n = 60$	$n = 8$	4) $\frac{15}{n} + 6 = 11$	$n = 3$
5) $80 - \frac{42}{n} = 73$	$n = 6$	6) $\frac{n}{10} + 6 = 15$	$n = 90$
7) $2n^2 - 12 = 20$	$n = 4$	8) $\frac{n^2}{5} + 15 = 35$	$n = 10$

Have a go! Find n

1) $6n - 7 = 47$	$n = 9$	2) $5n + 13 = 58$	$n = 9$	3) $9n + 18 = 54$	$n = 4$
4) $55 - 3n = 22$	$n = 11$	5) $78 - 7n = 1$	$n = 11$	6) $10 + 8n = 74$	$n = 8$
7) $81 - 5n = 46$	$n = 7$	7) $11n - 50 = 27$	$n = 7$	9) $\frac{20}{n} + 16 = 21$	$n = 4$
10) $100 - \frac{56}{n} = 93$	$n = 8$	11) $\frac{n}{9} + 66 = 69$	$n = 27$	12) $\frac{n}{5} + 16 = 20$	$n = 20$

Challenge Find n

1) $3n^2 - 60 = 15$	$n = 5$	2) $81 - 4n^2 = 65$	$n = 2$
3) $\frac{n^2}{9} + 16 = 20$	$n = 6$	4) $\frac{75}{n^2} + 7 = 10$	$n = 5$

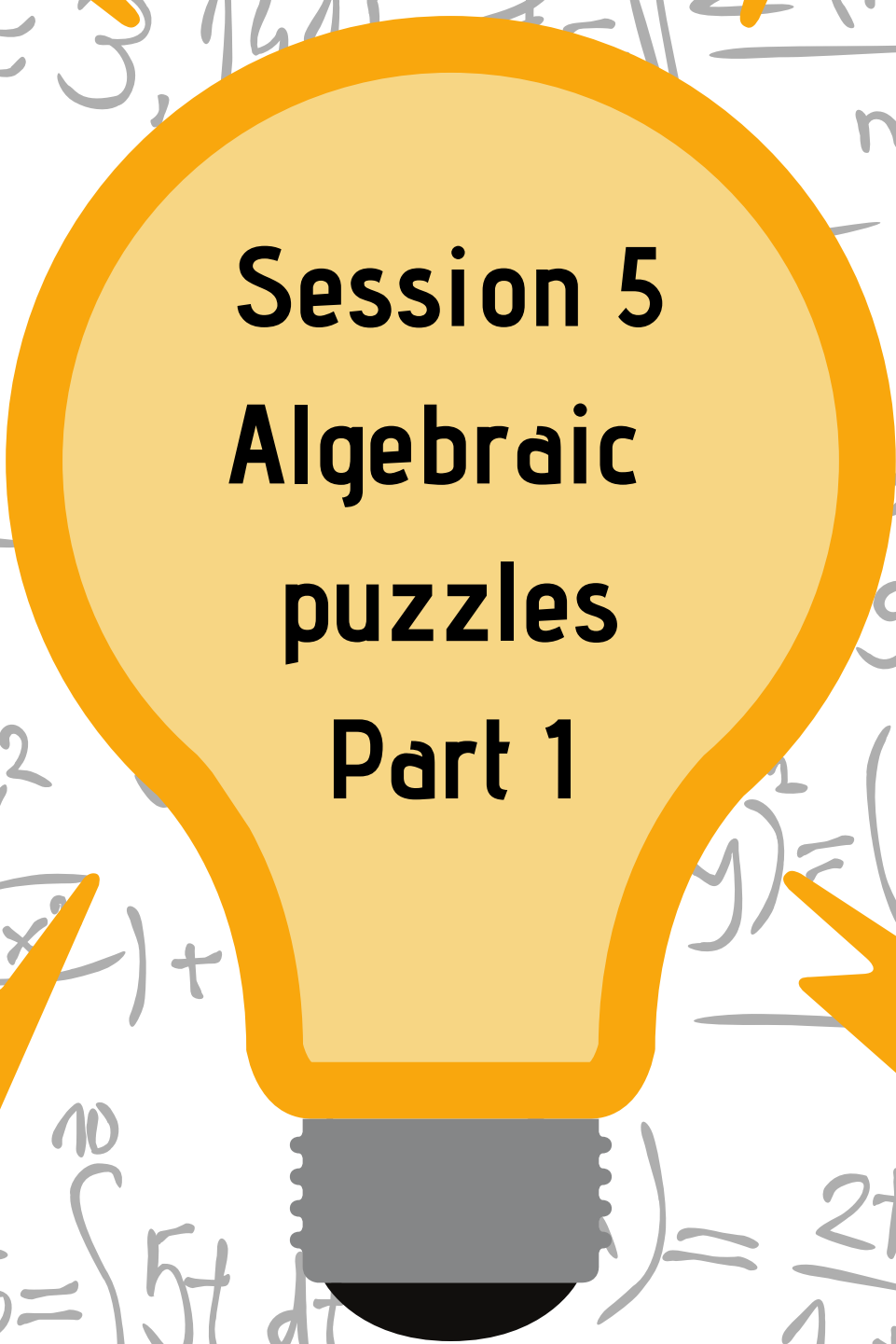


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**Session 5
Algebraic
puzzles
Part 1**

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Session 5: Algebra Puzzles Part 1



Practice section:

Find the value of each symbol

$$\text{Watermelon} + \text{Banana} + \text{Fries} = 32$$

$$\text{Banana} + \text{Banana} + \text{Fries} = 29$$

$$\text{Watermelon} + \text{Fries} + \text{Fries} = 34$$

Find the value of each symbol

$$\begin{array}{|c|c|c|c|} \hline \text{Circle} & \text{Arrow} & \text{Circle} & \text{Arrow} \\ \hline \end{array} = 54$$

$$\text{Circle} = ?$$

$$\text{Arrow} = ?$$

$$\begin{array}{|c|} \hline \text{Arrow} \\ \hline \end{array} = 39$$

Find the value of each symbol

$$\begin{array}{|c|c|c|c|} \hline \text{Green Circle} & \text{Green Circle} & \text{Blue Triangle} & \text{Yellow Star} \\ \hline \end{array} = 36$$

$$\begin{array}{|c|c|} \hline \text{Yellow Star} & \text{Yellow Star} \\ \hline \end{array} = 18$$

$$= 30$$

$$\text{Blue Triangle} = ?$$

$$\text{Green Circle} = ?$$

$$\text{Yellow Star} = ?$$

Find the value of each symbol

$$\text{SUV} + \text{Red Car} + \text{Yellow Car} = 38$$

$$\text{SUV} + \text{Red Car} + \text{Red Car} = 32$$

$$\text{Yellow Car} + \text{Red Car} + \text{Yellow Car} = 30$$

Have a go!

Find the value of each symbol

$$\text{Thundercloud} + \text{Sun} + \text{Rainbow} = 27$$

$$\text{Thundercloud} + \text{Sun} + \text{Thundercloud} = 15$$

$$\text{Thundercloud} + \text{Rainbow} + \text{Rainbow} = 33$$

Find the value of each symbol

$$\begin{array}{|c|c|c|c|} \hline \text{Purple Star} & \text{Blue Star} & \text{Blue Star} & \text{Purple Star} \\ \hline \end{array} = 70$$

$$\text{Purple Star} = ?$$

$$\text{Blue Star} = ?$$

$$\begin{array}{|c|} \hline \text{Purple Star} \\ \hline \end{array} = 55$$

Find the value of each symbol

$$\begin{array}{|c|c|c|c|} \hline \text{Elephant} & \text{Elephant} & \text{Monkey} & \text{Elephant} \\ \hline \end{array} = 38$$

$$\begin{array}{|c|} \hline \text{Monkey} \\ \hline \end{array} = ?$$

$$\text{Elephant} = ?$$

$$= 31$$

Find the value of each symbol

$$\begin{array}{|c|c|c|c|} \hline \text{Lightning} & \text{Plus} & \text{Crescent} & \text{Crescent} \\ \hline \end{array} = 33$$

$$\begin{array}{|c|c|} \hline \text{Lightning} & \text{Lightning} \\ \hline \end{array} = 16$$

$$= 29$$

$$\text{Plus} = ?$$

$$\text{Crescent} = ?$$

$$\text{Lightning} = ?$$

Find the value of each symbol

$$\begin{array}{|c|c|c|c|} \hline \text{Sun} & \text{Sun} & \text{Rainbow} & \text{Rainbow} \\ \hline \end{array} = 34$$

$$\begin{array}{|c|c|} \hline \text{Sun} & \text{Rainbow} \\ \hline \end{array} = 17$$

$$= 40$$

$$\text{Rainbow} = ?$$

$$\text{Sun} = ?$$

$$\text{Cloud} = ?$$





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Session 5: Answers



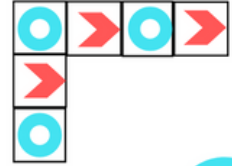
Answers


 = 12


 = 9


 = 11

ANSWERS


 = 54


 = 39


 = 12


 = 15


Answer


 = 36

 = 18


 = 30


 = 5


 = 11

 = 9


Answers


 = 20


 = 6

 = 12

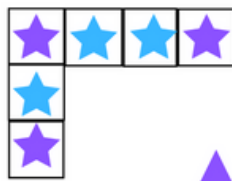
Answers

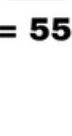
 = 3


 = 9


 = 15

Answers

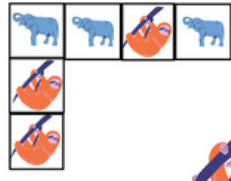
 = 70


 = 55


 = 20


 = 15


Answer

 = 38


 = 31


 = 11


 = 9





Answer


 = 33

 = 16


 = 29

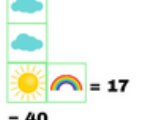
 = 7


 = 9


 = 8


Answer


 = 34

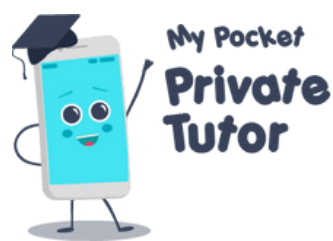
 = 17

 = 40

 = 4

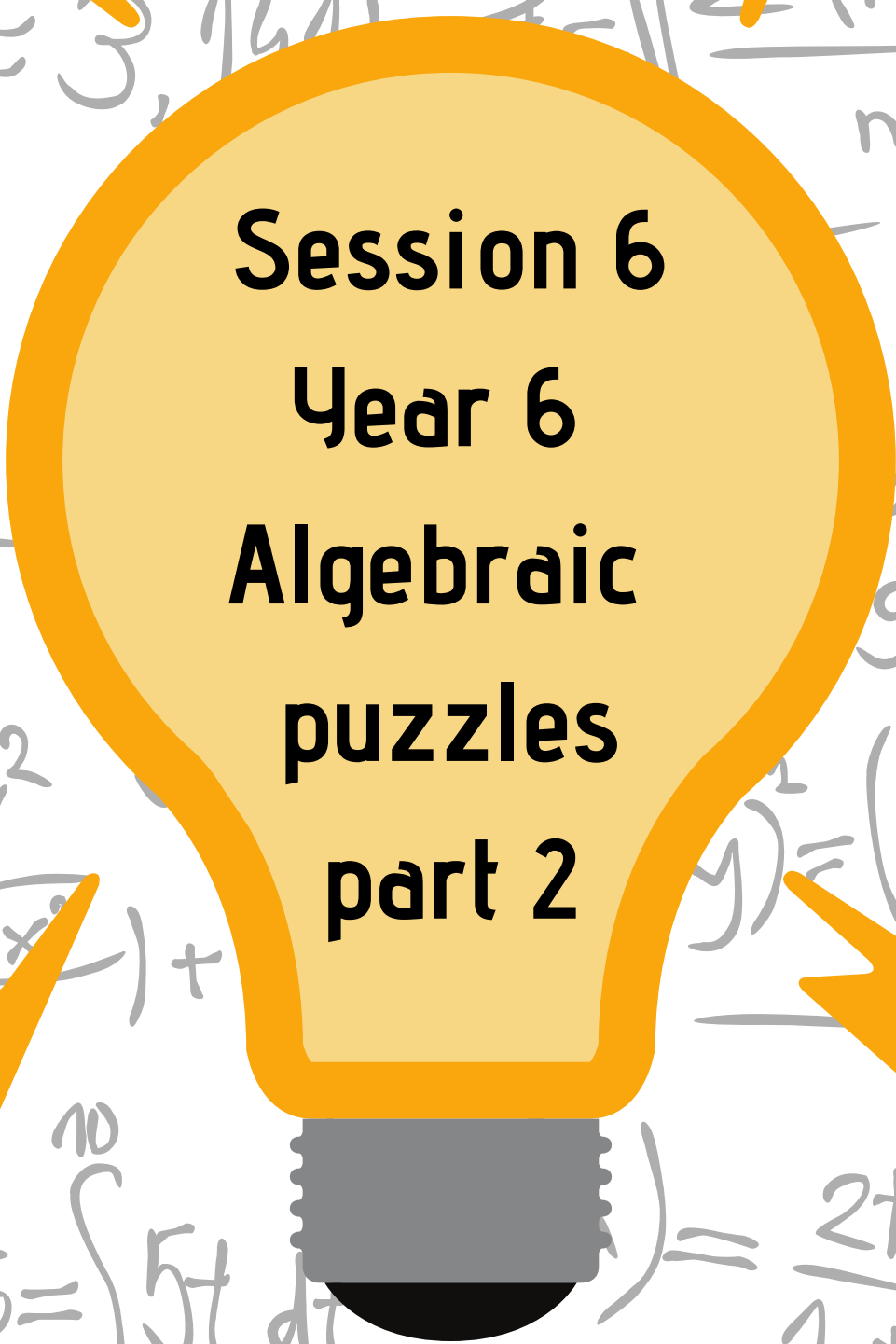
 = 13

 = 7



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Session 6
Year 6
Algebraic
puzzles
part 2








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Session 6: Algebra Puzzles Part 2










Practice section:











 +  +  = 23
 ÷  = 2
 -  = 2
 = ?  = ?  = ?











  -  = 12
 < 10  > 3
List the possible values
 








Find the values if...








  ×  = 54
 If  = 3  = ?
 If  = 3  = ?

Have a go!








 +  +  = 33
 ÷  = 2
 ÷  = 3
 = ?  = ?  = ?

 +  +  = 25
 -  = 9
 ×  = 24
 = ?  = ?  = ?








  -  = 18
 > 10  < 18
List the possible values
 

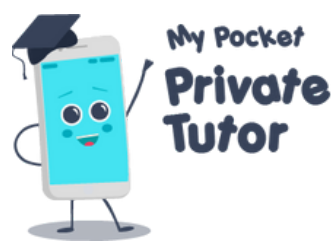
  -  = 9
 < 15  > 9
List the possible values
 

Find the values if...

  ÷  = 5
 If  = 10  = ?
 If  = 10  = ?

Find the values if...

  ×  = 36
 If  = 9  = ?
 If  = 3  = ?








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Session 6 Answers









Practice section:



 +  +  = 23

 ÷  = 2



 -  = 2

 = 8  = 10  = 5

  -  = 12




 < 10  > 3



List the possible values



 

a) 9, b) 8 a) 6, b) 4




Find the values if...



  ×  = 54



If  = 3  = 9




If  = 3  = 9

Have a go!




 +  +  = 33



 ÷  = 2



 ÷  = 3




 = 6  = 18  = 9




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 +  +  = 25

 -  = 9



 ×  = 24

 = 15  = 4  = 6




  -  = 18



 > 10  < 18

List the possible values



 

a) 12, b) 14, c) 16 a) 15, b) 16, c) 17

  -  = 9




 < 15  > 9



List the possible values



 

a) 13, b) 11 a) 11, b) 10




Find the values if...



  ÷  = 5



If  = 10  = 4

If  = 10  = 25

Find the values if...

  ×  = 36

If  = 9  = 2

If  = 3  = 6



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