Week 2
Term 1
2024

HAWKER COLLEGE
Engage | Inspire | Achieve

EM1
Calculations, percentages and rates

Goals

Goals for this week:

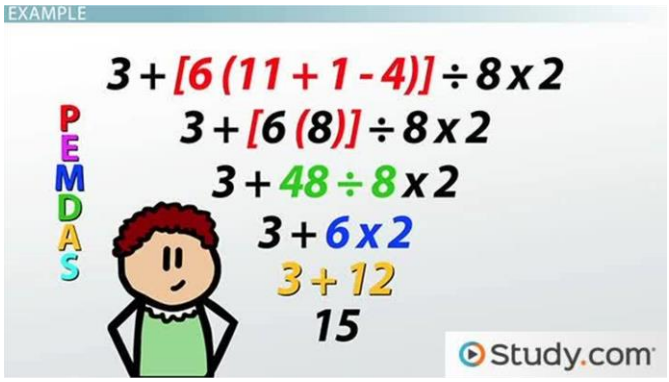
- solve practical problems requiring basic number operations
- apply arithmetic operations according to their correct order
- ascertain the reasonableness of answers to arithmetic calculations

Theoretical Components

STEP 1

Resources:
PDF file: Week 2 Notes and Exercises
YouTube videos: Linked in the PDF file

This Week:
We will be looking at how to calculate arithmetic sentences using numbers and the order of operations i.e. the order in which you do brackets, ×, ÷, +, – when carrying out calculations.



Practical Components

STEP 2
Read through Week 2 Notes and Exercises for instructions on what to do.

There are 2 Exercises in this booklet. Read any worked examples before you begin.

BEDMAS/BODMAS

Remember to regularly check Google Classroom for messages.

Portfolio Task

STEP 3

Complete the task at the end of the brief and submit your weekly work. 😊

Other

Remember to check Google Classroom or hawkermaths.com for each week's learning brief. Make sure you have joined the Google Classroom. If you have not, see your teacher.


(B)
O²
Brackets
Orders
Division
Multiplication
Addition
Subtraction
1st
Start with anything inside brackets.
2nd
Are there any powers or square roots?
Division and multiplication rank equally.
3rd
Working from left to right, calculate them in the order they appear.
PAPERZIP
Addition and subtraction also rank equally.
4th
Again, start from the left and work your way across the equation.

WEEK 2 – CALCULATIONS

Order of Operations

To avoid possible ambiguity or two different answers to the same calculations, mathematicians have a specific order in which calculations are completed.

i.e. $3 + 4 \times 5$ cannot be allowed to equal both 35 and 23 (23 is the correct answer).

This is the agreed way to complete a calculations:

- Do what is inside the **brackets** first.
- Then do any **multiplication (×)** or **division (÷)**, always start at the left and work to the right.
- Then do any **additions (+)** and **subtractions (−)**, again working from left to right.

A useful acronym to remember the order of operations is **BEDMAS** or **BODMAS**

Brackets
Exponentials (Powers)
Division
Multiplication
Addition
Subtraction

Brackets
Order of (Powers)
Division
Multiplication
Addition
Subtraction

Example: What is the value of $12 \div 3 + 4 \times 5$?

Solution: No brackets, do multiplication and division first from left to right, then addition.

$12 \div 3 = 4$ and $4 \times 5 = 20$ and $4 + 20 = 24$.

Example: Simplify $6 \times (2 + 3) \div 10$

Solution: Do brackets first, then multiplication and division from left to right.

$2 + 3 = 5$ and $6 \times 5 = 30$ and $30 \div 10 = 3$.

Exercise 1

1. Complete the following calculations using the correct order of operations. Do the calculations manually first and then check your answers on a calculator.

$34-(2\times5)=$ ____ $(6+3)\times3=$ ____

$7\times(5+8)=$ ____ $58-(2\times4)=$ ____

$(2+6)\times6=$ ____ $(9+7)\times5=$ ____

$(4+3)\times2=$ ____ $13-(2\times3)=$ ____

$8\times(4+6)=$ ____ $(2+3)\times4=$ ____

$42-(2\times4)=$ ____ $50-(2\times8)=$ ____

$(4+1)\times1=$ ____ $97-(2\times5)=$ ____

$48-(2\times8)=$ ____ $1\times(7+5)=$ ____

2. Complete the following calculations using the correct order of operations (BEDMAS).

$94-9^2 =$ ____

$26-1^2 =$ ____

$26-7^2 =$ ____

$28-8^2 =$ ____

$2^2+2=$ ____

$7^2+4^2 =$ ____

$28-4^2 =$ ____

$8^2+4=$ ____

$96-2^2 =$ ____

$25-2^2 =$ ____

$9^2+3=$ ____

$5^2+5=$ ____

$8^2+8^2 =$ ____

$98-4^2 =$ ____

$28-3^3 =$ ____

$96-6^2 =$ ____

3. Complete the following calculations using the correct order of operations.

$2\times(9^2+1)=$ _____

$7\times4+69=$ ____

$79+(4\times4)\div2=$ ____

$7\times5+71=$ _____

$7\times9^2+45=$ _____

$5\times4+27=$ ____

$9\times2^2+27=$ ____

$8\times(7^2-5)=$ _____

$4\times(6^2-9)=$ _____

$88-1^2+1=$ ____

$8\times(4^2+2)=$ _____

$4\times9+98=$ _____

$8\times(6^2+6)=$ _____

$3\times9^2+94=$ _____

$3\times4+78=$ ____

$3\times8+18=$ ____

4. Do you know another acronym for orders of operations?

5. Mr Healy, the school principal, has a problem. He has an angry parent in his office. The parent is complaining about the marking of his daughter's maths exam. He claims his daughter's answer is marked wrong when it is right, and he is using his pocket calculator to demonstrate that his daughter's answer is right.

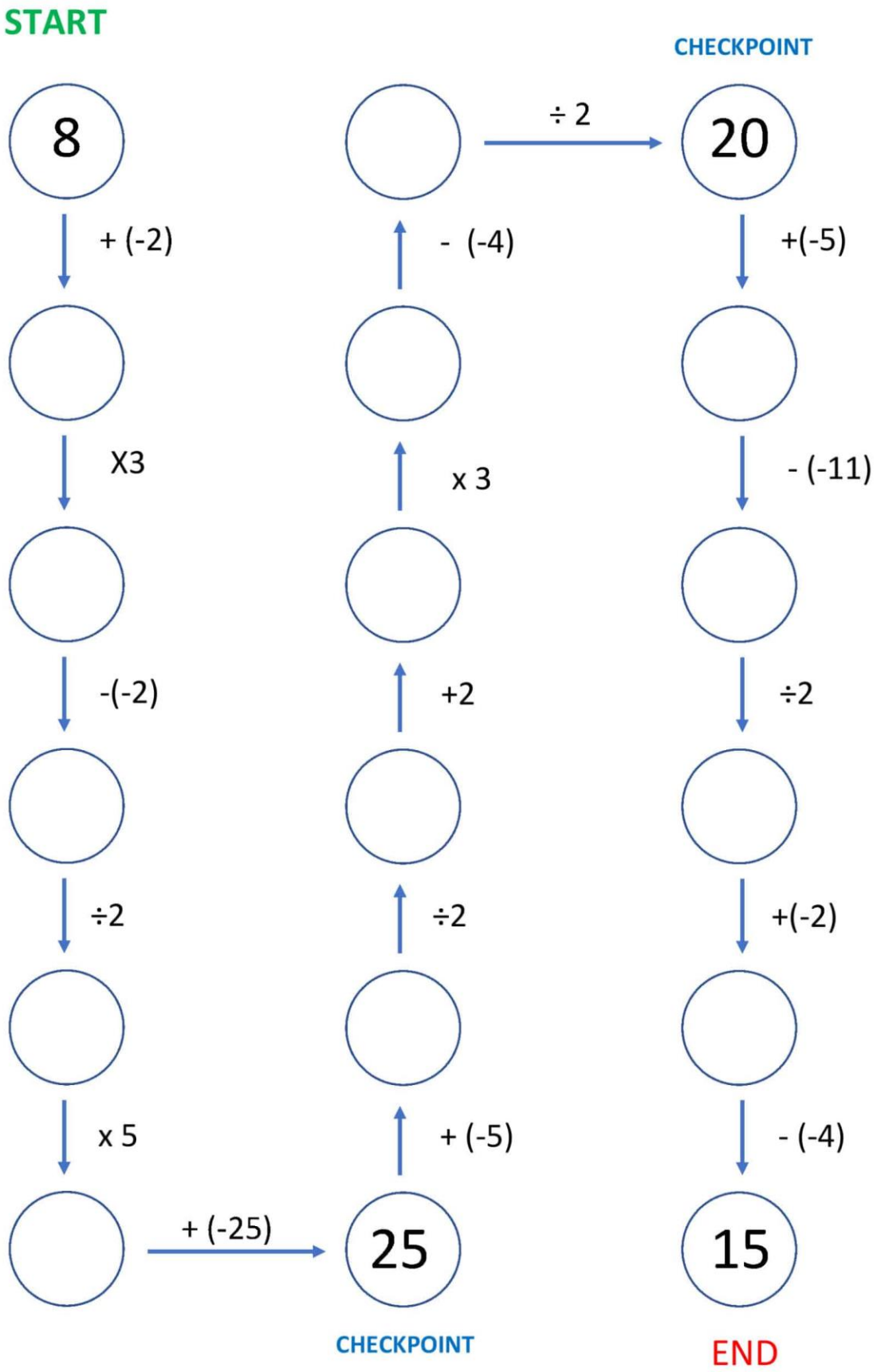
   This is the question: "What is the basic numeral for $48 - 8 \times 3$? His daughter's answer is 120.

   a. Why is the daughter's answer wrong? What is the correct answer?

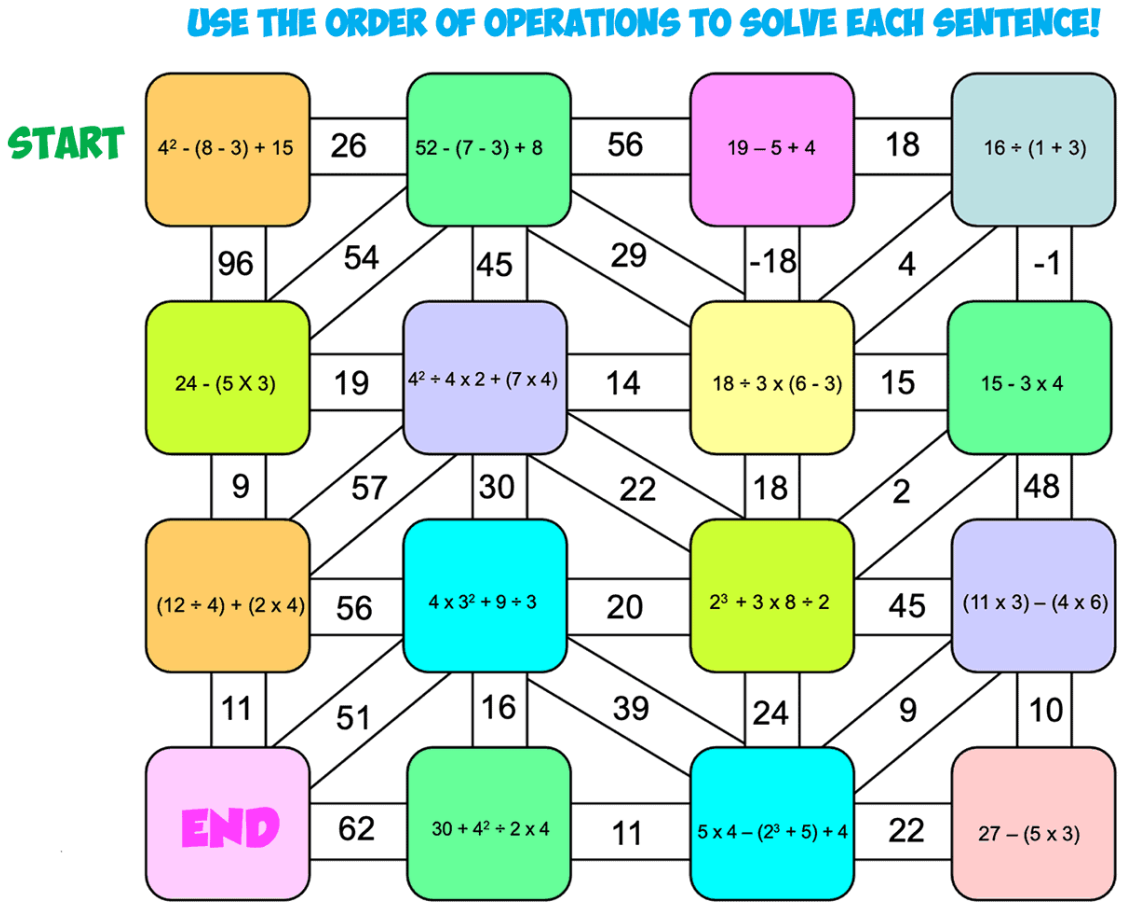
   b. How could Mr Healy explain why the daughter's answer is wrong?

   c. Put brackets in $48 - 8 \times 3$ to make the daughter's answer correct.

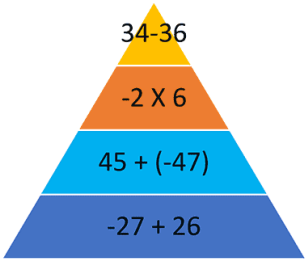
6. Solve the integer maze.

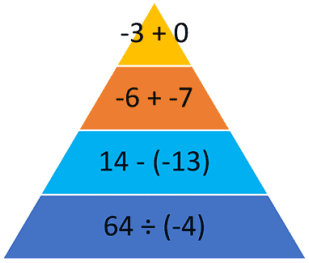


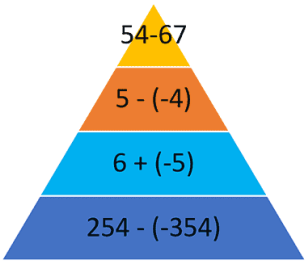
7. Solve the order of operation maze.

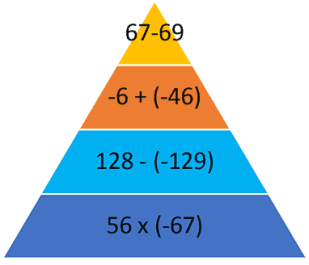


8. Circle the pyramids that have expressions with all negative answers.









Exercise 2

Frobenius Numbers – Otherwise known as McNugget numbers!

Watch this clip: https://www.youtube.com/watch?v=vNTSugyS038

Now, answer this question… If McDonald's nuggets came in the following pack options, 3, 6 and 10. What size nuggets could we not make (just like they investigated in the clip)?

On the next page, the numbers from 1 to 42 are listed in a table. Next to the numbers that work, list the combinations that make it work. This leaves the number of the nuggets that do not work.

Number		Number	
1		22	
2		23	
3		24	
4		25	
5		26	
6	2 x 3, 1 x 6	27	
7		28	
8		29	
9		30	
10		31	
11		32	
12		33	
13		34	
14		35	
15		36	
16		37	
17		38	
18		39	
19		40	
20		41	
21		42	

Week 2 Portfolio Task

Watch this clip: https://www.youtube.com/watch?v=D6tINlNluuY

This clip focusses on the number 42.
Answer the following questions.

1. What is the relationship between a piece of A4 paper and the moon? What is the problem with this connection (think of actually doing this)?

2. They also mention in this clip about how the number 42 comes up everywhere, but really all numbers come up everywhere. Think about your week so far – what numbers have you seen already? In what context did you see these numbers? List at least 3 examples.

MARKING RUBRIC

CRITERIA	EXPECTATIONS	POSS	MULT	GIVEN	TOTAL
Practical	Student completes practical work, including exercises of the brief to an acceptable standard set by the teacher.	**2**	**3**		**/6**
Portfolio Task	Student completes the portfolio task of the week to an acceptable standard set by the teacher.	**2**	**2**		**/4**
Reasoning and Communications	Student responses are **accurate** and appropriate in presentation of mathematical ideas, with **clear** and logical **working out** shown.	**4**	**-**		**/4**
Concepts and Techniques	Student submitted work selects and applies **appropriate** mathematical modelling and **problem solving techniques** to solve practical problems, and demonstrates **proficiency** in the use of **mathematical facts, techniques** and **formulae**	**4**	**-**		**/4**
	Submission Guidelines				
Timeliness	Student submits the exercises and portfolio tasks by the set deadline. See scoring guidelines for specific details.	**2**	**-**		**/2**
		FINAL			**/20**

Student Reflection:
How did you go with this week's work?

What was interesting?

What did you find easy?

What do you need to work on?