Work Backwards

How Much Money?
Ana gave Bill and Clare as much money as each had. Then Bill gave Ana and Clare as much money as each had. Then Clare gave Ana and Bill as much money as each had. Then each of the three people had $24. How much money did each have to begin with?

Thinking about Numbers
I am thinking of a number. Add three to it. Multiply the result by 2. Subtract 4 and then divide by 7. The number I end up with is 2. What was the number I first though of?

I think of a number and multiply it by 2, then subtract 8. This result is then divided by 4. I end up with 4. What number did I think of originally?

The Long Cycle
Sally cycles one third of the way to school and then is driven the remaining six kilometres by a friend's family. How far does she live from the school?

Doubling Rabbits
The number of rabbits in my rabbit farm doubles each month. At the end of last month there were 24 000 rabbits. When were there 1500 rabbits?

Apples
I bought some apples from the supermarket. I used 13 of them to make a pie, and then my brother ate three of them. There are now 7 left. How many apples did I buy originally?

Ying's Purse
Ying started the day with a certain amount of money in her purse. She spent $30 on a shirt, and then half the money remaining in her purse was spent on lunch. She borrowed $40 from a friend, and spent half the money remaining in her purse on a book. Ying now has $30 left in her purse. How much did she have in her purse at the start of the day?
John’s Age
John is four years younger than Carmel but Jane is 24 years older than Carmel. If Jane is 35, how old is John?

The Marble Collection
Nima and Kelly each own a collection of marbles. While playing during the day, Nima lost 3 marbles and Kelly lost 4. At the end of the day, Nima gave a third of her remaining marbles to Kelly, so that each of them had 22 marbles. How many marbles did each girl own at the start of the day?

Todd’s Weight
Todd is trying to lose weight. For 6 weeks he keeps a record of his weight loss or gain for the week. At the end of the 6 weeks, Todd weighs 85 kg.

<table>
<thead>
<tr>
<th>Week</th>
<th>Result</th>
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<tbody>
<tr>
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<tr>
<td>2</td>
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<tr>
<td>3</td>
<td>gain 2 kg</td>
</tr>
<tr>
<td>4</td>
<td>lose 2 kg</td>
</tr>
<tr>
<td>5</td>
<td>gain 1 kg</td>
</tr>
<tr>
<td>6</td>
<td>lose 2 kg</td>
</tr>
</tbody>
</table>

Find …
- Todd’s weight at the end of week 3
- Todd’s initial weight.

Mum’s Age
Two years ago, my mother was 7 times older than me. In one year’s time, my father will be 5 times older than me. My father is currently 39 years old. How old is my mother now?

The Long Walk
Nikora left home at a certain time. He rode his bike for 20 minutes, then walked for a further 15 minutes. He rested there for half an hour before continuing on to Sam’s house, which was a further 25 minutes walk away. Nikora played at Sam’s house for 45 minutes before moving on to his grandmother’s home which took him another 20 minutes. He arrived at his grandmother’s home, at noon, just in time for lunch. What was the time he left his home that morning?

Class Weight
Four students in the class weighed themselves. Carter was 15 kilograms lighter than Adrian. Gary was twice as heavy as Carter and Jeremy was seven kilograms heavier than Gary. If Jeremy weighed 71 kilograms what was Adrian’s weight?
Let’s Weigh Ourselves
When three girls jumped on a weighing scale together, it read 164 kilograms. One girl stepped off and the scale moved down to 104 kilograms. One more girl jumped off and the scale showed 55 kilograms. What was each girl’s weight?

The Spelling Competition
In a spelling competition all the competitors were on stage together. After three minutes, a fifth of the students had made mistakes and were excluded from the competition. In the next five minutes half of those remaining were eliminated by extremely difficult words. Two minutes later four students were found cheating and were sent home. After fifteen minutes of the competition half of the remaining students had made mistakes and left the stage. In the last few minutes one more competitor made an unfortunate mistake and one contestant was left as the winner of the spelling competition. How many children originally entered the competition?

Arnie's Cupcakes
Arnold baked cupcakes over the weekend. Each day during the week he took three cakes to school to share with his friends. On Saturday when he counted there were 18 left. How many had he baked?

Dan's Pets
Daniel has lots of pets. He has four more goldfish than he has turtles. He has one less canary than goldfish. Six of his pets are birds (canaries and parrots). He has two parrots. How many pets does Daniel have?

Rich Jemima
Jemima has twice as much money as Matthew. Jemima has four times as much money as Sally. Sally has $3 more than Andrew. If Matthew has $14, how much money do Andrew, Sally and Jemima have?

The Boys’ Ages
Jack, Terence, Sharon and Alex are neighbours. Jack is half as old as Sharon. Sharon is three years older than Alex. Alex’s and Sharon’s ages added together equal 17 years. Terence is eight. Who is the youngest?

Flags of the World
A teacher bought five flags of different countries, to use in a class activity. She added them to the flags she already had in the classroom. She borrowed four more flags, but two of these weren’t used. In the end ten flags were used in the activity. How many flags were there in the classroom already?
Fishing
Four girls each caught a fish while at the beach. Teri’s was double the size of Jane’s. Jane’s fish was shorter than Lynn’s by nine centimetres. Lynn’s was 18 centimetres longer than Reina’s who caught a fish 30 centimetres long. How long were Teri’s, Jane’s and Lynn’s fish?

Ages
Joshua is five years older than David. Simon is four years older than Joshua and nine years older than David. Simon’s and David’s ages added together equal 15. How old are the boys?

Party Foods
At the party Jade ate less than four jelly beans. Nicole ate twice as many jelly beans as Jade. Kahlee had twice as many as Nicole. Chris had two more than Kahlee. Chris ate ten jelly beans. How many jelly beans were eaten at the party?

The Skipping Contest
Mark, Neil, Frances and Patrick entered a skipping competition. Patrick skipped eight more times than Mark before his foot caught on the rope. Mark jumped three more times than Neal. Neal skipped half as many times as Frances. Frances skipped eighty times. How many times did Patrick skip?

The Bus Ride
When Ariella climbs aboard there are already some people sitting the bus. At the next bus stop an additional five people get on and two people get off. Two stops later seven people climb on board. All 15 people get off the bus at the ferry. How many were on the bus when Ariella climbed on?

The Texta Jar
There is an old jar packed full of textas on the table. There are twice as many red textas as blue and one more yellow than red. Eight textas are either yellow or green. There are three green textas. How many blue textas are in the jar?

The New Shoes
My new shoes arrived in a rectangular cardboard box. The length of the box was double the width and the width was double the height. The length was 28 centimetres. What was the volume of the shoebox?
Strawberry Picking
Three people went strawberry collecting and picked 65 strawberries between them. At the first plant they each picked the same amount of strawberries. At the second plant they each collected three times the amount that they had collected at the first plant. After picking from the third plant they had five times the amount they had after picking strawberries from the first two plants. At the fourth plant they collected only five strawberries altogether. How many strawberries did each person collect at the first bush?

Ladybirds
Twenty four ladybirds were sitting at various places around the garden. One sixth of the ladybirds flew away to settle in the garden. Half of the remaining ladybirds sat on a yellow sunflower. Then half of those on the sunflower flew onto a fence post. There were no ladybirds on the hedge, but one fifth of the ladybirds on the sunflower flew onto the lavender bush. If one ladybird was on the grass, how many were on the tree trunk?

Heather’s Roses
Heather loves roses. In her rose garden she has half as many pink roses as red, and four times as many red ones as white. There are 36 roses that are either yellow or white. Twenty are yellow. How many roses are in Heather’s garden?

Ball Bouncing
Four children were bouncing balls. Jeff’s ball bounced eight more times than Michael’s. Michael’s ball bounced half as many times as Olivia’s. Olivia’s bounced eight times. How many times did Jeff’s ball bounce?

Olivia’s Break
Olivia is packing for vacation. Her large suitcase will fit 36 items of clothing and her small suitcase will fit 18 items of clothing. If she wants to bring 60 items of clothing, how many will she have to leave behind?

Gavin’s Finances
Gavin is saving up to buy a new bicycle. The one he wants costs $125. His mother is giving him $50, but he will have to earn the rest by mowing lawns for $5 each. How many lawns will he have to mow before he can buy the bicycle?

Reading Matter
It’s 2:00 p.m. and Marvin needs to finish reading a 150 page book before returning it to the library at 5:00 p.m. He has already read 90 pages of the book. How many pages an hour does he have to read to return the book on time?
The Flower Girl
Francesca is a flower girl in a wedding. She has to drop rose petals on the ground with every other step she takes down the aisle. If it will take her 18 steps to make it down the aisle and her basket holds 360 rose petals, about how many petals can she drop each time?

School Trip
Sarah got on the school bus. At the stop after Sarah’s, 7 students got on. Five students got on the bus at the next stop. At the last stop before the school, 9 students got on. When the bus arrived at school, 38 students got off. How many students were already on the bus when Sarah got on?

The Bake Sale
Mrs Allen baked some cookies for the school bake sale. Franco bought 3 of the cookies and Chandra bought 2. Mr Walker bought 1 dozen of the cookies. William and Starr each bought 6 cookies. Then Ms Porter bought 4 of the cookies. That left only 3 cookies for Scott to buy. How many cookies did Mrs Allen bake for the sale?

Family Ages
Dave, Nora, Tony, and Andrea are members of the same family. Dave is 2 years older than Andrea, who is 21 years older than Tony. Tony is 4 years older than Nora, who is 7 years old. How old are Dave, Tony, and Andrea?

Music for Sale
Paula went shopping at a department store. She bought 2 CDs on sale for $8.95 each, a notebook for $4.29, and a bottle of shampoo for $2.58. When Paula paid for her purchases, the cashier gave her $5.23 in change. How much money did Paula give the cashier?

The Stamp Collector
Brian gave 10 stamps from his collection to both Sam and Rob. Then he gave 14 stamps to Kathy and 6 stamps to Grace. He still had 275 stamps. How many stamps were in Brian’s collection to begin with?

The Cinema’s Seats
Attendance at the UCI cinema on the following Monday was much better. However, only half as much attended on Tuesday. On Wednesday 60 people less attended than on Tuesday. If 30 people attended on Wednesday, how many attended on Monday?
Friends’ Ages
Jane is eight year younger than William. Sharon is half the age of Jane. Sharon is 6 years old. How old is William?

Teeth Brushing
Stephen, Jack and Rebecca all love sweets but hate brushing their teeth. Consequently they all have lots of dental fillings. Rebecca has three times as many as Stephen. Jack has three more than Rebecca. Jack has nine fillings. How many fillings do they have altogether?

Cinema Tickets
Four children and 1 adult are going to a movie at 4:00 p.m. The price of a ticket is $10.00 for an adult and $6.00 for a child. Movie tickets for shows before 6 P.M. are half price. How much will they pay for their tickets?

Animal Sightings
Janice saw 8 dogs, 4 cats, and 19 frogs for sale in the pet store. If the store sells 2 dogs and 1 cat each week, how many dogs and cats will there be at the end of the month?

The Laundry Pile
In a pile of laundry there are 14 pairs of socks, 10 shorts, and 12 shirts. How many pieces of clothing are there altogether?

Dog Training
Each dog owner paid $50 for a training class. If there are 3 classes in all, how much did each owner pay?

Race Cars
Sean and Dave are playing with toy race cars. Sean has his cars lined up in 3 rows. He has 5 cars in each row. How many cars does he have in all?

Main Street Pets
Every home on Main Street has a dog and other pets. The first house has 1 dog and 1 cat. The second house has 1 dog and 2 cats. The third house has 1 dog and 3 rabbits. The fourth house has 1 dog and 4 angel fish. If the pattern continues, the fifth house has 1 dog and how many hamsters?

The Pet Sitter
Ann is a pet babysitter. She gets paid to help the families on Main Street with their pets every day. The first week she earned $2. The second, $4. The third, $6. The fourth, $8. What did she earn by the seventh week?
The Pet Parade
Ann decided to set up a pet parade. She had the pet owners walking in rows with their pets. In the first row she put 1 owner with 1 pet. The second row had 2 owners with 1 pet each. The third row had 1 pet owner and 2 pets. The fourth row had 2 pet owners with 2 pets each. The fifth row had 1 pet owner with 3 pets. If the pattern continues, what did the sixth row have?

The Model Cars
Tyrell gave 4 of his model cars to his friends Ted and Ameil. He gave the same number of cars to each friend. Write a division fact to show how many cars Tyrell gave to Ted.

The Stones
Jodie is helping her Mum in the backyard. She needs to move 17 big stones to the front. The wheelbarrow can hold 2 stones. Can she move all of the stones to the front yard in 8 trips?

Hamburgers
Every Saturday, Mr and Mrs Thompson and their 3 children each have a hamburger for lunch. There are 40 hamburger patties in their freezer. In how many weeks will they finish the last of the patties?

Snack Time
There are 5 small bags of banana chips, 8 small bags of pretzels, and twice as many packets of nuts as pretzels. How many bags of snacks are there?

Irene’s Pets
The combined age of Irene’s pets is 23 years. The cat is 5 years older than the dog. If the dog isn’t 10 yet, how old could the cat be?

Tara’s Hotel Stay
Tara gets to her hotel at 11:15 a.m. She was traveling for 1 hour 45 minutes. At what time did Tara start traveling?

The New Baby Quilt
The baby’s quilt is 2 metres wide by 3 metres long. Mark’s Mum offered to make one twice as big. What will the perimeter of the new quilt be? Marta has two 10c pieces, six 5c pieces and one 20c piece. Does she have enough to buy an apple that costs 75 cents?
Magic Numbers
If you add 54 to a number, subtract 29, and the result is 30, what was your original number?

Walk to School
Marisela walks to and from school each day. It takes her 13 minutes to walk to school. How much time does Marisela spend walking to and from school each week?

Sum Difference
There are two numbers whose sum is 9 and the difference is five. What are the two numbers?

Elevator Limits
The sign on the elevator says that it can safely carry 3,000 kilograms. If you estimate that the average human weighs 150 kilograms, how many people can ride in the elevator at one time?

A Trip to Dallas
A round trip ticket to Dallas is about $325. A one way ticket with restrictions can be purchased for $89. How much money can I save buying two one way tickets with restrictions?

Getting Ready for School
School starts at 8:45 a.m. Nick needs 30 minutes to get dressed and eat breakfast. It then takes him 35 minutes to get to school. What time does he have to wake up to be on time for school?

Melanie’s Herbs
Melanie planted chives in her herb garden. After 2 weeks, they grew to 4 cm. The next day, they measured 5 1/2 cm. The day after that, they measured 7 cm. If they continue growing at this rate, how tall were the chives the day after that?

Pepe’s Bulbs
Pepe needs to put light bulbs on the second floor of his house. Two of the bedrooms have ceiling lamps that need 3 bulbs each. The other bedroom has 2 lamps that each need 1 bulb. The 4 bulbs above the bathroom mirror also need to be replaced. How many bulbs does Pepe need in all?
The New Television
A 36-inch television costs $509 at Sam’s Electronics. This month it is on sale for $449. To the nearest hundred dollars, what is the sale price of the television?

Fran’s Flowers
Fran likes to buy flowers each week. The first week she buys white flowers, the second week she buys red flowers, and the third week she buys yellow flowers. If the pattern continues, what color will she buy in the fifth week?

CD Sales
Josh sold a CD to Vera for $5.55. Vera gave Josh a $10 note for the CD. Josh has no 20c pieces or 10c pieces, but gives Vera the correct amount of change. Tell what bills and coins he may have given her.

Heather’s Shout
Heather spent $4 for a salad and $2 for a drink. She bought the same lunch for 3 of her friends. She paid with three $10 notes. How much change did she get back?

Angie’s Ear Rings
Angie collects pairs of earrings. She hangs them on an earring tree. On the first row she hung 9 pairs, on the second row she hung 7 pairs, and on the third row she hung 5 pairs. If she continued this pattern, how many pairs would Angie hang on the fourth row? How many pairs of earrings does she have in all four rows?

The Pizza Palace
Four people at the Pizza Palace left the waiter a tip. Each person left a tip of the same amount. The total tip was $8. Work backwards with subtraction to show how much each person left for a tip.

Alana’s Mail
Alana mailed 6 letters in 3 different mailboxes. She mailed the same number of letters in each mailbox. How many letters did she mail in each mailbox?

At the Aquarium
A mural in the aquarium shows octopuses and starfish. Each starfish has 5 arms. Each octopus has 8 legs. There are 20 starfish arms in all. The combined number of starfish arms and octopus legs is 60. How many octopuses are in the mural?
Larry's Dog
When Larry was in Year Four, his dog gained 7 kilograms. The dog was sick over the Summer holidays and lost 3 kilograms. When Larry was in Year Five, his dog weighed 81 kilograms. How much did Larry’s dog weigh when Larry started Year Four?

Christie's Haircut
Christie spent $6.50 on food and $22.50 on a haircut. She had $5.00 left. How much money did she have before she spent any?

Pouring Water
This morning 50ml of water was poured out of a container of water. Then 1 litre of water was added, making the total amount of water 1500 ml. How much water was in the container before any was poured?

Marty’s Diet
Marty has $6.25 at the end of the day. Today he bought lunch for $8.50, a bagel for breakfast for $1.25, a newspaper for $2.25 and a necklace for his mother for $37.75. He was paid $12.50 for delivering two boxes of paper to is Uncle’s Office. How much money did Marty have when he started his day?

The Fruit Punch
Cindy drank ¼ cup of fruit punch from a pitcher. Jackie drank 1 cup and Lauren drank two more. There are 2 cups of water left in the pitcher. How much of the fruit punch was in the pitcher before the girls drank any?

Will's Walk
It took Will 30 minutes to walk from his house to the Supermarket. He was in the Supermarket for 45 minutes and then walked for fifteen minutes to his Grandmother’s house. It was 3:00 p.m. when he arrived at his Grandmother’s house. What time did Will leave his house?

Inside Out
Find the problems that would make the problems correct.

a. __ + 135 = 240
b. __ + 12 = 69
c. __ - 123 = 87
d. __ - 23.6 = 6.9
e. __ \times 7 = 154
f. __ \div 20 = 30
**Fifty Niner**
Mr Falconer, the evil Maths Teacher challenges his class to a game of fifty niner. He says that if he wins all of the games then the class will receive double homework. To the horror of the class, Mr Falconer wins all of the games and their homework is doubled.

**The rules of Fifty Niner**
- It is a game for two people.
- Each student takes it in turns to move a counter to any of the numbers 1, 2, 3, 4 or 5 and keeps a running total.

**Example …**
- I go to first and move to 3.
- My opponent moves to 1.
- The total is now 12.
- The winner of the game is the first person to reach 59.

**The Problems**
- Explain, with examples, what strategy Mr Falconer would use that could allow him to win every game.

**Task One**
- With a partner, play the game of Fifty Niner. Take turns at going first. Use a Show Me Board to make a Game Sheet like the one to the right.

**Take Two**
- With your partner use the same Game Sheet, but this time the winning total is to be 13.
- The numbers to be added on are still 1, 2, 3, 4 or 5.
- Take turns going first.
- Find a strategy that would allow you to win each time.
- Explain this strategy with examples.

**Task Three**
- With your partner, play a similar game, but this time the winning total is to be 20.
- The numbers to be added on are still 1, 2, 3, 4 or 5.
- Take turns going first.
- Find a strategy that would allow you to win each time.
- Explain this strategy with examples.