

How you get started

tenSHion Diagnostic v1.0.2 · Printable booklet · Form A

Name _____

Class or period _____

Date _____

Before you start

- This is not a grade. It shows your teacher how you get started on problems. Questions marked “counts toward participation” do count.
- Work in order. **Do not turn back to an earlier page.** When you finish a page, keep going forward.
- “I don’t know” and “Skip” are real answers. Tick them when they are true.
- Scratch paper and a basic calculator are fine. No phones, other people, or AI tools.
- Your teacher will look at your answers, your scratch work, and the times you write at the start and end of each section.
- A few questions check that you are reading closely. They are not graded.

Warm-up question

1. (not graded)

Students study in lots of different ways. Some like quiet, some like music, and some work best with friends nearby. Think about which one fits you. Now look at the four buttons below. Whatever you would normally choose, do not pick that. To show you have read to the end of this paragraph, pick the button that says **Purple** instead.

- ☐ Quiet
- ☐ Music
- ☐ With friends
- ☐ Purple

Finish time: _____

Warm-up

Short questions with no tricks. If you don't know one, "I don't know" is a useful answer.

Start time (read the clock): _____

2.

What is $7 + 5$?

Answer: _____

☐ I don't know

3.

What is $10 - 4$?

Answer: _____

☐ I don't know

4.

What is 6×3 ?

Answer: _____

☐ I don't know

5.

What is $9 + 8$?

Answer: _____

☐ I don't know

6.

What is $36 \div 4 + 5$?

Answer: _____

☐ I don't know

7.

What is $\frac{3}{4}$ of 80?

Answer: _____

☐ I don't know

8.

What is 20% of 150 ?

Answer: _____

☐ I don't know

9.

This table shows pay for hours worked.

Hours	Pay
1	\$12
2	\$24
3	\$36
4	\$48

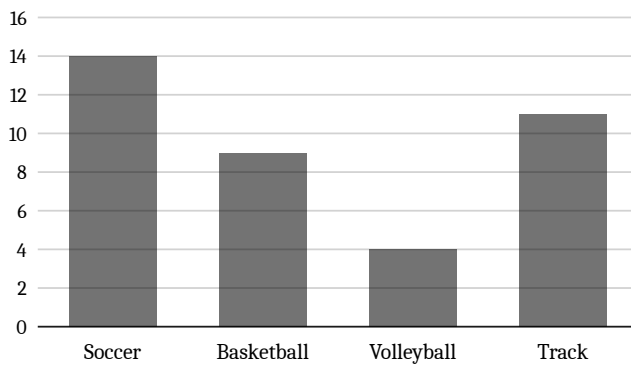
How much is the pay for 6 hours?

Answer: _____

☐ I don't know

10.

Students picked their favorite sport.



How many more students picked Soccer than Volleyball?

Answer: _____

☐ I don't know

11.

What number comes next?

5, 9, 13, 17, ?

Answer: _____

☐ I don't know

12.

The pattern 3, 6, 9, 12, ... follows a rule. Which expression gives the n th number?

☐ $n + 3$

☐ $3n$

☐ n^3

☐ $3 + 3n$

☐ I don't know

13.

Solve for x :

$$3x - 4 = 20$$

Answer: _____

☐ I don't know

14.

What is the mean (average) of 5, 9, 7, 11, and 13?

Answer: _____

☐ I don't know

Finish time: _____

Investigations

Each one starts with a pattern. Use the work area however you like. If you get stuck, press "I'm stuck" for a nudge.

Start time (read the clock): _____

15.

A walkway is built from square stones. Here are the first three walkways.

Walkway	Amount
Walkway 1	5 stones
Walkway 2	8 stones
Walkway 3	11 stones

How many stones does **Walkway 25** need?

Work area: show anything you try, notice, or wonder. Messy is fine.

Your answer: _____

- ☐ Skip
- ☐ I used a nudge. (Nudges are printed upside down. Read them only if you are stuck.)

Nudge 1: Write the number for Walkway 4. What comes after 5, 8, 11?

Nudge 2: How much does the number of stones go up each time?

Nudge 3: From Walkway 1 to Walkway 25, how many times does it go up?

16.

A banquet hall puts tables in a row. Here is how many people sit at the first three rows of tables.

Tables	Amount
1 table	6 people
2 tables	10 people
3 tables	14 people

How many people can sit at **30 tables**?

Do this first.

Before the big question, fill in the next two.

4 tables = _____ 5 tables = _____

Work area: show anything you try, notice, or wonder. Messy is fine.

Your answer: _____

- ☐ Skip
- ☐ I used a nudge. (Nudges are printed upside down. Read them only if you are stuck.)

Nudge 1: Write the number for 4 tables. What comes after 6, 10, 14?

Nudge 2: How many people does each new table add?

Nudge 3: From 1 table to 30 tables, how many tables get added?

17.

Star-shaped signs are made from dots. Here are the first three signs.

Sign	Amount
Sign 1	7 dots
Sign 2	12 dots
Sign 3	17 dots

How many dots does **Sign 30** need?

Do this first.

Before the big question, fill in the next two.

Sign 4 = _____ Sign 5 = _____

Work area: show anything you try, notice, or wonder. Messy is fine.

Your answer: _____

- ☐ Skip
- ☐ I used a nudge. (Nudges are printed upside down. Read them only if you are stuck.)

Nudge 1: Write the number for Sign 4. What comes after 7, 12, 17?

Nudge 2: How many dots get added each time?

Nudge 3: From Sign 1 to Sign 30, how many times do dots get added?

18.

A jar holds coins you are saving. Here is the total after each of the first three days.

Day	Amount
Day 1	\$9
Day 2	\$11
Day 3	\$13

How much is in the jar on **Day 45**? (Enter just the number.)

Work area: show anything you try, notice, or wonder. Messy is fine.

Your answer: _____

☐ Skip

☐ I used a nudge. (Nudges are printed upside down. Read them only if you are stuck.)

Nudge 1: Write the total for Day 4. What comes after 9, 11, 13?

Nudge 2: How much is added each day?

Nudge 3: From Day 1 to Day 45, how many days get added?

Finish time: _____

Quick problems

Each problem has a short note at the top telling you how it will be used. Read it, then answer.

Start time (read the clock): _____

19.

Best guess is fine here. This one is not graded, and a wrong answer or a blank costs you nothing.

A shirt costs \$24. It is on sale for 25% off. What is the sale price in dollars?

Answer: _____

How sure are you? ☐ Guessing ☐ Pretty sure ☐ Certain
☐ I don't know

20.

Your teacher will read your answer to this one. It is not graded.

A recipe uses 3 cups of flour for 12 cookies. How many cups are needed for 20 cookies?

Answer: _____

How sure are you? ☐ Guessing ☐ Pretty sure ☐ Certain
☐ I don't know

21.

This one counts toward your participation points.

A phone plan costs \$15 per month plus \$0.10 for each text. What is the cost in dollars for a month with 120 texts?

Answer: _____

How sure are you? ☐ Guessing ☐ Pretty sure ☐ Certain
☐ I don't know

22.

This one counts toward your participation points.

A runner goes 6 miles in 48 minutes at a steady pace. How many minutes will 10 miles take at that pace?

Answer: _____

How sure are you? ☐ Guessing ☐ Pretty sure ☐ Certain
☐ I don't know

23.

Your teacher will read your answer to this one. It is not graded.

A savings account starts with \$50 and gets \$15 added each week. After how many weeks will it first have at least \$200?

Answer: _____

How sure are you? ☐ Guessing ☐ Pretty sure ☐ Certain

☐ I don't know

24.

Best guess is fine here. This one is not graded, and a wrong answer or a blank costs you nothing.

A class has 28 students. $\frac{3}{7}$ of them walk to school. How many do **not** walk?

Answer: _____

How sure are you? ☐ Guessing ☐ Pretty sure ☐ Certain

☐ I don't know

Finish time: _____

Which deal is better?

Some of these let you pick the situation the problem is about.

Start time (read the clock): _____

25.

Circle ONE situation you would like for this problem, then solve only that version.

☐ **Sports**

Two ways to pay for the climbing gym.

Pass A: \$24 to join, then \$2 per visit.

Pass B: no joining fee, \$6 per visit.

After how many visits do the two options cost exactly the same?

☐ **Games**

Two ways to pay for an online game.

Plan A: \$24 up front, then \$2 per match.

Plan B: no up-front cost, \$6 per match.

After how many matches do the two options cost exactly the same?

☐ **Music**

Two ways to rent a practice room.

Option A: \$24 deposit, then \$2 per session.

Option B: no up-front cost, \$6 per session.

After how many sessions do the two options cost exactly the same?

☐ **Building things**

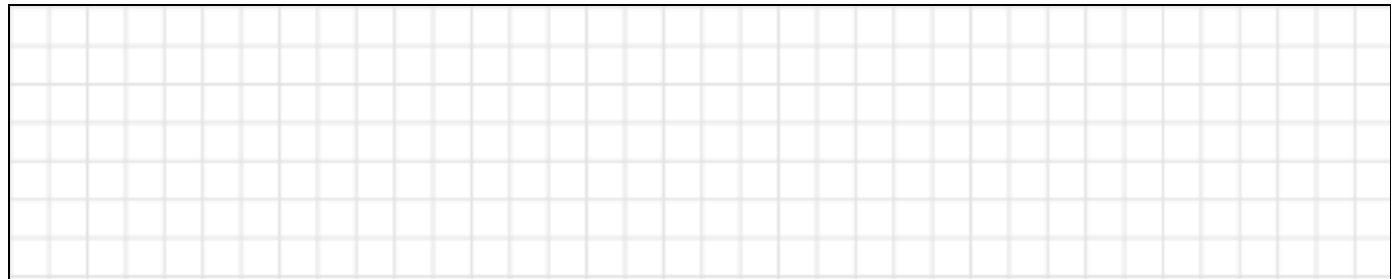
Two ways to rent a power tool.

Rental A: \$24 deposit, then \$2 per day.

Rental B: no up-front cost, \$6 per day.

After how many days do the two options cost exactly the same?

Work area: show anything you try, notice, or wonder. Messy is fine.



Your answer: _____

☐ Skip

☐ I used a nudge. (Nudges are printed upside down. Read them only if you are stuck.)

Nudge 1: Make a small table: 1 use, 2 uses, 3 uses, and the total cost of each option.
Nudge 2: Option A starts higher but adds less each time. Which total is bigger after 3 uses? After 6?
Nudge 3: Keep going until the two totals match.

26.

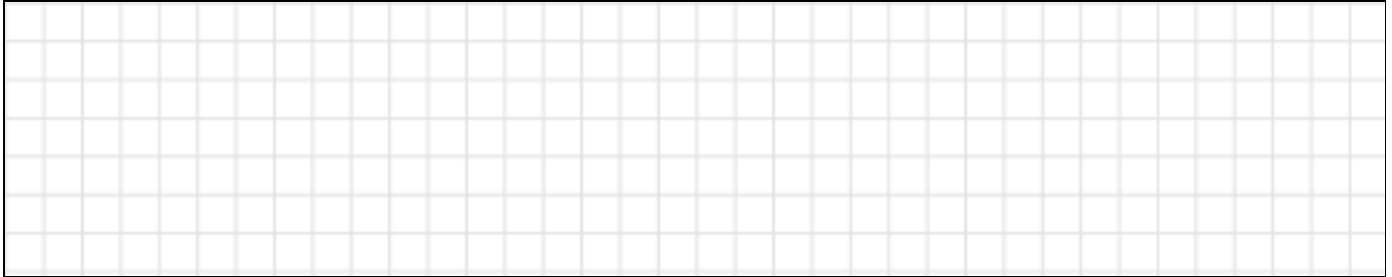
Two ways to pay for the city bus.

Pass A: \$40 for the card, then \$3 per ride.

Pass B: no up-front cost, \$8 per ride.

After how many rides do the two options cost exactly the same?

Work area: show anything you try, notice, or wonder. Messy is fine.



Your answer: _____

☐ Skip

☐ I used a nudge. (Nudges are printed upside down. Read them only if you are stuck.)

Nudge 1: Make a small table: 1 use, 2 uses, 3 uses, and the total cost of each option.
Nudge 2: Option A starts higher but adds less each time. Which total is bigger after 3 uses? After 6?
Nudge 3: Keep going until the two totals match.

27.

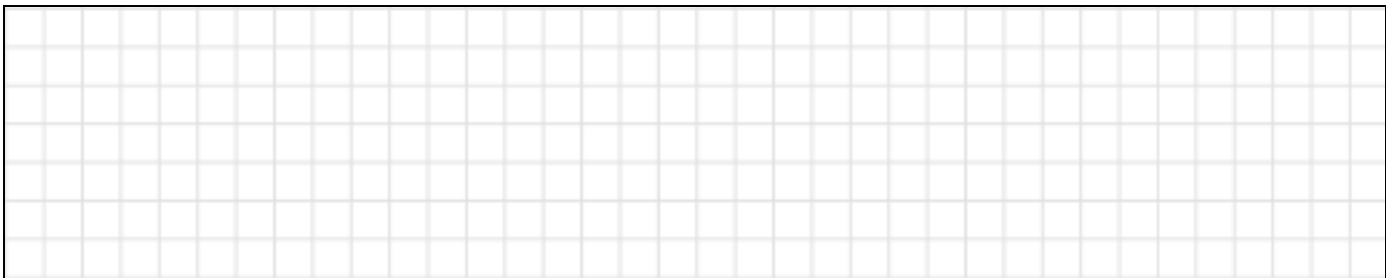
Two ways to pay for downtown parking.

Plan A: \$45 to sign up, then \$4 per day.

Plan B: no up-front cost, \$9 per day.

After how many days do the two options cost exactly the same?

Work area: show anything you try, notice, or wonder. Messy is fine.



Your answer: _____

☐ Skip

☐ I used a nudge. (Nudges are printed upside down. Read them only if you are stuck.)

Nudge 1: Make a small table: 1 use, 2 uses, 3 uses, and the total cost of each option.
Nudge 2: Option A starts higher but adds less each time. Which total is bigger after 3 uses? After 6?
Nudge 3: Keep going until the two totals match.

28.

Circle ONE situation you would like for this problem, then solve only that version.

☐ **Sports**

Two ways to pay for the climbing gym.

Pass A: \$60 to join, then \$5 per visit.

Pass B: no joining fee, \$10 per visit.

After how many visits do the two options cost exactly the same?

☐ **Games**

Two ways to pay for an online game.

Plan A: \$60 up front, then \$5 per match.

Plan B: no up-front cost, \$10 per match.

After how many matches do the two options cost exactly the same?

☐ **Music**

Two ways to rent a practice room.

Option A: \$60 deposit, then \$5 per session.

Option B: no up-front cost, \$10 per session.

After how many sessions do the two options cost exactly the same?

☐ **Building things**

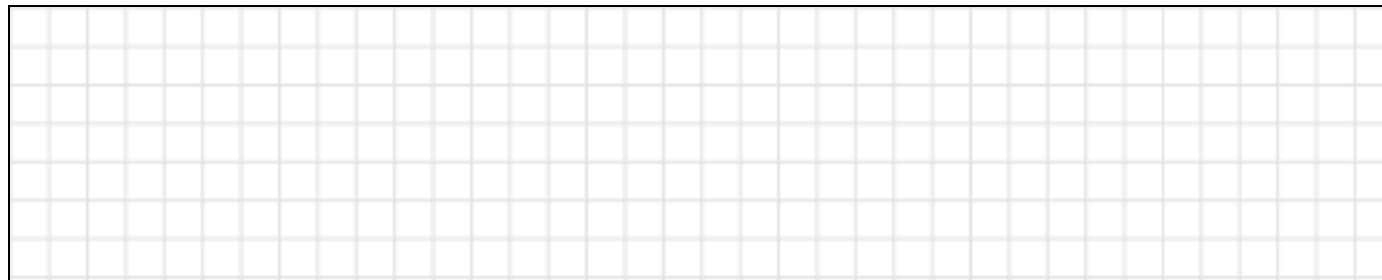
Two ways to rent a power tool.

Rental A: \$60 deposit, then \$5 per day.

Rental B: no up-front cost, \$10 per day.

After how many days do the two options cost exactly the same?

Work area: show anything you try, notice, or wonder. Messy is fine.



Your answer: _____

☐ Skip

☐ I used a nudge. (Nudges are printed upside down. Read them only if you are stuck.)

Nudge 1: Make a small table: 1 use, 2 uses, 3 uses, and the total cost of each option.
Nudge 2: Option A starts higher but adds less each time. Which total is bigger after 3 uses? After 6?
Nudge 3: Keep going until the two totals match.

29. (not graded)

Imagine you are helping plan a school fundraiser. There are many jobs to do: setting up tables, making posters, selling tickets, and cleaning up afterward. You could say which job you like best, but that is not what this screen wants. Here is the real instruction: ignore your favorite and choose the **second** option from the top.

- ☐ Setting up tables
- ☐ Making posters
- ☐ Selling tickets
- ☐ Cleaning up

Finish time: _____

Multi-step problems

Some of these give you only answer choices. Others walk you through the steps first. Either way, work it out; don't guess.

Start time (read the clock): _____

30.

A jacket costs \$80. It is 25% off. Then a 10% tax is added to the sale price. What is the final price?

What is the final price?

- ☐ \$60
- ☐ \$68
- ☐ \$66
- ☐ \$88

Use the margin for scratch work, or ☐ I don't know.

31.

A printer prints 12 pages per minute. A report is 180 pages and you need 2 copies. The printer needs 3 minutes to warm up before it starts. How many minutes until both copies are done?

Step 1

How many pages are in 2 copies?

- ☐ 180
- ☐ 192
- ☐ 360
- ☐ 2160

Step 2

The printer must print 360 pages at 12 pages per minute. How many minutes of printing is that?

- ☐ 372
 - ☐ 30
 - ☐ 4320
 - ☐ 15
-

31. (last step)

A printer prints 12 pages per minute. A report is 180 pages and you need 2 copies. The printer needs 3 minutes to warm up before it starts. How many minutes until both copies are done?

Last step. Finish the steps on the previous page first.

How many minutes until both copies are done?

- ☐ 18
 - ☐ 33
 - ☐ 30
 - ☐ 363
-

32.

A garden is 12 m long and 5 m wide. A path 1 m wide goes all the way around the outside of the garden. What is the area of the path, in square meters?

Step 1

With the path included, how long and wide is the outer rectangle?

- ☐ 13 m by 6 m
- ☐ 14 m by 7 m
- ☐ 12 m by 5 m
- ☐ 14 m by 6 m

Step 2

The outer rectangle is 14 m by 7 m. What is its area?

- ☐ 42
- ☐ 21
- ☐ 88
- ☐ 98

Step 3

The garden itself is 12 m by 5 m. What is its area?

- ☐ 60
 - ☐ 34
 - ☐ 17
 - ☐ 70
-

32. (last step)

A garden is 12 m long and 5 m wide. A path 1 m wide goes all the way around the outside of the garden. What is the area of the path, in square meters?

Last step. Finish the steps on the previous page first.

What is the area of the path?

- ☐ 34
 - ☐ 60
 - ☐ 98
 - ☐ 38
-

33.

Paint is mixed 3 parts blue to 2 parts white. There are 30 liters of the mix. On Monday, half of the mix is used. How many liters of **blue** paint are used on Monday?

How many liters of blue paint are used on Monday?

- ☐ 9
- ☐ 15
- ☐ 18
- ☐ 6

Use the margin for scratch work, or ☐ I don't know.

Finish time: _____

One longer problem

This one has five parts. Each part builds on the ones before it, so do them in order.

Start time (read the clock): _____

34.

Your club sells T-shirts. The print shop charges a **\$60 setup fee plus \$5 for each shirt** printed. You sell each shirt for **\$12**.

a. What does it cost to print 40 shirts?

Answer: _____

☐ I used a nudge. Setup fee first, then 40 shirts at \$5 each.

b. If all 40 shirts sell, how much money comes in?

Answer: _____

☐ I used a nudge. 40 shirts at \$12 each.

c. What is the profit on those 40 shirts? (Profit = money in – cost.)

Answer: _____

☐ I used a nudge. Use your answers to the first two parts.

d. You print only as many shirts as you sell. What is the smallest number of shirts you must sell to make any profit at all?

Answer: _____

☐ I used a nudge. Try 5 shirts, then 8, then 9. Compare money in with cost each time.

e. How many shirts must you print and sell to make a profit of exactly \$500?

Answer: _____

☐ I used a nudge. Each shirt adds \$12 and costs \$5. How much profit does one shirt add after the setup fee is paid?

Finish time: _____

Reasoning

These are about thinking carefully, not calculating. You can add a sentence about why you chose your answer.

Start time (read the clock): _____

35.

Every student in Ms. Ortega's class passed the quiz. Dana did **not** pass the quiz. Which statement **must** be true?

- ☐ Dana is in Ms. Ortega's class.
- ☐ Dana is not in Ms. Ortega's class.
- ☐ Dana did not study.
- ☐ The quiz was too hard.

Why? One sentence is plenty (optional).

36.

Four friends ran a race. Ana finished before Ben. Cal finished after Ben. Dee finished before Ana. Who finished **third**?

- ☐ Ana
- ☐ Cal
- ☐ Ben
- ☐ Dee

Why? One sentence is plenty (optional).

37.

Each card has a letter on one side and a number on the other. You can see: **E, K, 4, 7.**

The rule is: "*If a card has a vowel on one side, then it has an even number on the other side.*" Which cards must you turn over to find out whether the rule is broken?

- ☐ E and 4
- ☐ E only
- ☐ All four cards
- ☐ E and 7

Why? One sentence is plenty (optional).

38.

A school finds that students who eat breakfast score 10 points higher on tests than students who don't. A board member says, "Let's give every student free breakfast to raise test scores." What is the best reason to be cautious about that conclusion?

- ☐ Ten points is too small to matter.
- ☐ Students who eat breakfast may also differ in other ways, like sleep or home routines.
- ☐ Test scores can't really be measured.
- ☐ Breakfast is unhealthy for most students.

Why? One sentence is plenty (optional).

39.

A student solves $2(x + 3) = 14$ like this:

Step 1: $2x + 3 = 14$
Step 2: $2x = 11$
Step 3: $x = 5.5$

Which step contains the **first** mistake?

- ☐ Step 3
- ☐ Step 1
- ☐ Step 2
- ☐ There is no mistake.

Why? One sentence is plenty (optional).

40.

Each of two people either always tells the truth or always lies. Ava says, "Ben is a liar." Ben says, "Ava and I are both truth-tellers." Who is telling the truth?

- ☐ Ben tells the truth; Ava lies.
- ☐ Both are liars.
- ☐ Both are truth-tellers.
- ☐ Ava tells the truth; Ben lies.

Why? One sentence is plenty (optional).

Finish time: _____

Different subjects

Same kind of work, other topics: science, code, reading, and spatial thinking.

Start time (read the clock): _____

41.

A student grew the same kind of bean plant under four light levels for four weeks.

Light level	Height after 4 weeks
Full sun	18 cm
Partial shade	13 cm
Deep shade	6 cm
No light	1 cm

How many centimeters taller was the full-sun plant than the deep-shade plant?

What do you notice? What would you test next?

Your answer: _____

- ☐ Skip
- ☐ I used a nudge. (Nudges are printed upside down. Read them only if you are stuck.)

Nudge 1: Find the full-sun height in the table.
Nudge 2: Now find the deep-shade height.
Nudge 3: Subtract.

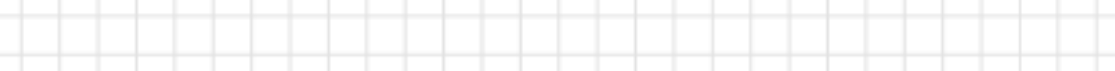
42.

Here is a short program.

```
x = 2
repeat 4 times:
    x = x * 2 + 1
print x
```

What number does it print?

Trace it however you like. Write what x is after each repeat.



Your answer: _____

☐ Skip

☐ I used a nudge. (Nudges are printed upside down. Read them only if you are stuck.)

Nudge 1: Start with $x = 2$. Do the inside line once. What is x now?

Nudge 2: Use that new x and do the line again.

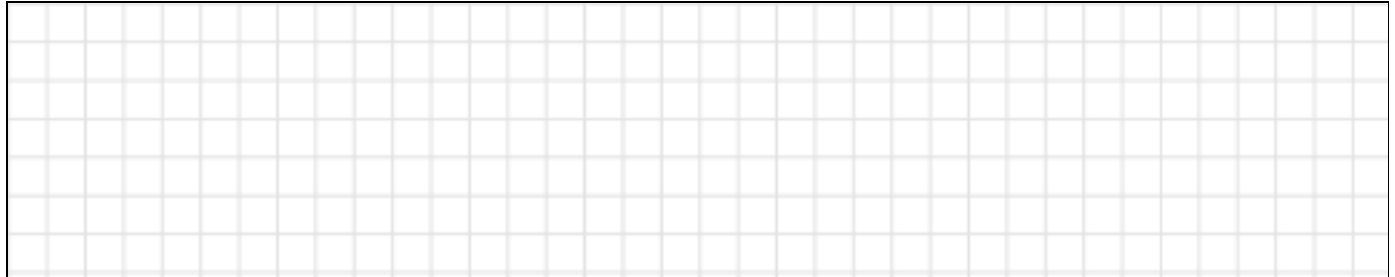
Nudge 3: Do it four times in total.

43.

Mara left the gate open on purpose. Her brother had been asking for weeks whether the neighbor's dog could visit. When the dog trotted into the yard and found a ball on the lawn, Mara was already holding a bowl of water. Her brother stared. "You knew," he said.

Why was Mara holding a bowl of water?

What do you notice or wonder about this story?



- ☐ She was thirsty.
- ☐ She had planned for the dog's visit.
- ☐ She wanted to water the lawn.
- ☐ She was washing the ball.

☐ Skip

☐ I used a nudge. (Nudges are printed upside down. Read them only if you are stuck.)

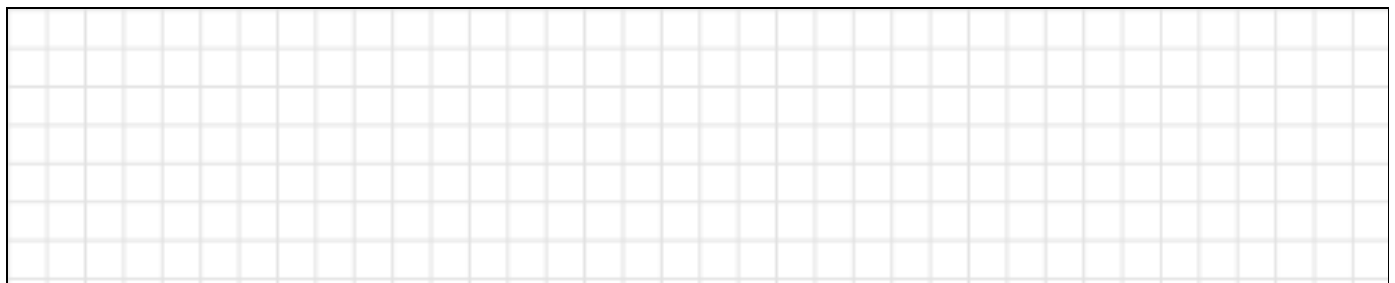
Nudge 1: Reread the first sentence. What does "on purpose" tell you?
Nudge 2: Who was the water for?

44.

A $3 \times 3 \times 3$ cube is painted red on every outside face. Then it is cut into 27 small cubes.

How many of the small cubes have **exactly one** red face?

Sketch it or describe it in words.



Your answer: _____

☐ Skip

☐ I used a nudge. (Nudges are printed upside down. Read them only if you are stuck.)

Nudge 1: Picture one face of the big cube: a 3×3 grid of small squares.
Nudge 2: Which of those 9 squares touch no edge of the big cube?
Nudge 3: There are 6 faces.

Finish time: _____

Getting harder

These get harder as you go. The last one is very hard, and many adults can't finish it quickly. You decide when to move on.

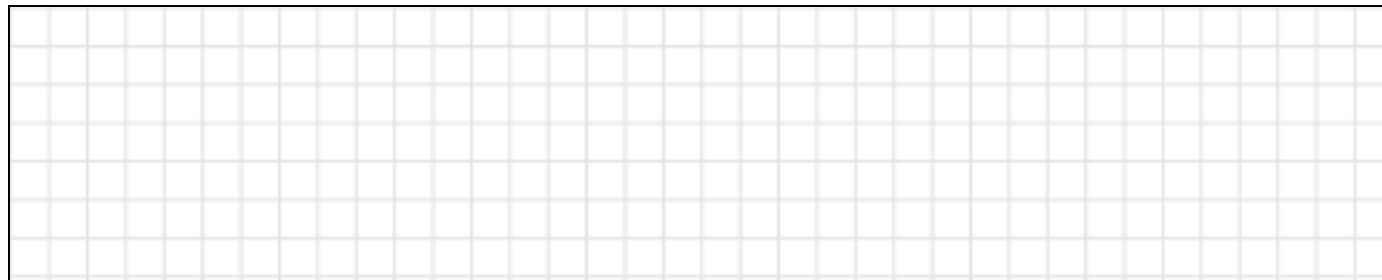
Start time (read the clock): _____

45.

What number comes next?

2, 6, 12, 20, 30, ?

Work area: show anything you try, notice, or wonder. Messy is fine.



Try 1: _____ Try 2: _____ Try 3: _____

☐ I solved it ☐ I moved on without solving it

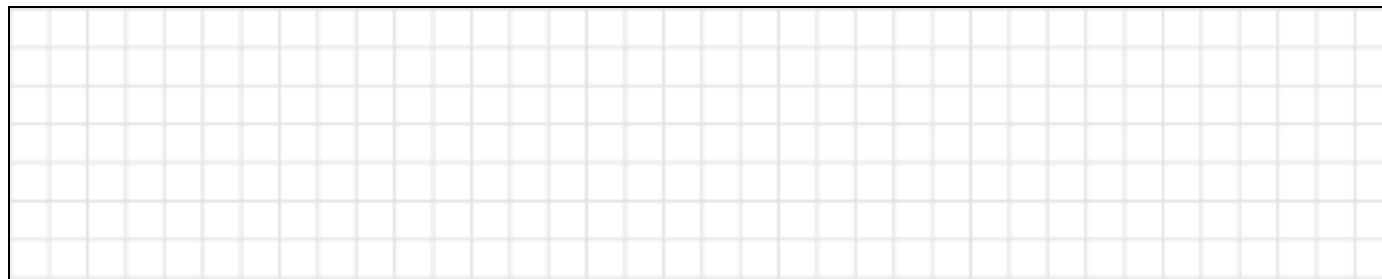
☐ I used a nudge. (Nudges are printed upside down. Read them only if you are stuck.)

Nudge 1: Look at the gaps between neighbors.
Nudge 2: The gaps are 4, 6, 8, 10...

46.

Three odd numbers in a row add up to 117. What is the largest of the three?

Work area: show anything you try, notice, or wonder. Messy is fine.



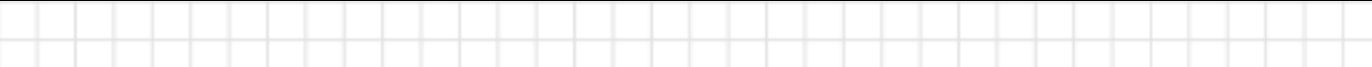
Try 1: _____ Try 2: _____ Try 3: _____

☐ I solved it ☐ I moved on without solving it

☐ I used a nudge. (Nudges are printed upside down. Read them only if you are stuck.)

Nudge 1: Try some small examples first, like 1, 3, 5.
Nudge 2: The middle number is the average of the three.

12 people are at a party. Everyone shakes hands with everyone else exactly once. How many handshakes happen in total?



☐ I used a nudge. (Nudges are printed upside down. Read them only if you are stuck.)

☐ I used a nudge. (Nudges are printed upside down. Read them only if you are stuck.)

Nudge 1: Try gluing some digits together, like 123 or 89.

Nudge 2: You need big numbers. What does 123 – 45 give?

49. (not graded)

Long tests can be tiring, and that is normal. Please do not click the first option you see. Instead, read this whole screen, because the answer it wants is the button labeled **Skip ahead**. The rest of this paragraph is only about how people feel after working for a while: some get restless, some get focused, and some just want it to be over.

- ☐ Tired
 - ☐ Fine
 - ☐ Bored
 - ☐ Skip ahead
-

Optional extras

You are finished with the required part. These puzzles are optional and not graded. Do as many or as few as you like.

☐ I tried this one

50.

Three boxes are labeled **Apples**, **Oranges**, and **Mixed**. Every label is wrong. You may take one fruit out of one box without looking inside. Which box should you pick from to work out all three?

☐ Apples

☐ Oranges

☐ Mixed

☐ Skip

☐ I tried this one

51.

What is $1 + 2 + 3 + \dots + 100$?

Answer: _____

☐ Skip

☐ I tried this one

52.

How many different 3-letter strings can you make using only the letters A and B? (Repeats allowed, like AAB.)

Answer: _____

☐ Skip

☐ I tried this one

53.

A sheet of paper is folded in half 5 times. How many layers thick is the folded stack?

Answer: _____

☐ Skip

Last part: a short survey

There are no right answers. Your teacher uses this to understand how to help.

	Strongly disagree	Disagree	Not sure	Agree	Strongly agree
When I don't know how to start a math problem, I wait for someone to show me.	☐	☐	☐	☐	☐
I would rather skip a problem than risk getting it wrong.	☐	☐	☐	☐	☐
When I get stuck, I try a different approach before asking for help.	☐	☐	☐	☐	☐
I start more easily when I can choose the situation a problem is about.	☐	☐	☐	☐	☐
I usually finish problems even when they are hard.	☐	☐	☐	☐	☐
Most math problems feel pointless to me.	☐	☐	☐	☐	☐
I feel nervous when my teacher can see my work in progress.	☐	☐	☐	☐	☐
Starting is the hardest part for me.	☐	☐	☐	☐	☐

When I don't start a problem, it is usually because (pick up to three):

- ☐ I'm not sure what the question is asking
- ☐ I understand it but don't know what to do first
- ☐ I'm afraid of getting it wrong
- ☐ It feels pointless or boring
- ☐ I'm tired or distracted
- ☐ I don't think I'm a math person
- ☐ I usually do start

Anything you want your teacher to know about how you work on problems? (Optional)