Two Quantities That Change Together

Two quantities that change together: Applications and decisions

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

An independent quantity is the input; the dependent quantity follows a rule. If $y = 2x + 1$, inputs $0, 1, 2$ give outputs $1, 3, 5$. The output increases by 2 for each input increase of 1, but starts at 1. A table, equation, and graph can show the same relationship.

Worked example

Complete the input-output table. Use $y = 2x + 1$ for $x = 0, 1, 2$.

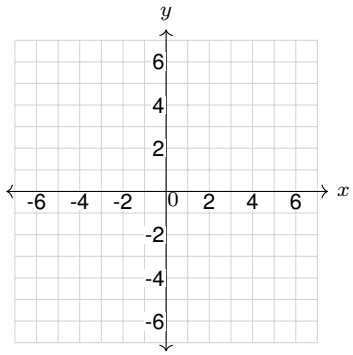
1. At $x = 0$, $y = 2 \times 0 + 1 = 1$.
2. At $x = 1$, $y = 2 \times 1 + 1 = 3$; at $x = 2$, $y = 2 \times 2 + 1 = 5$.
3. Each unit increase in x changes y by 2, with starting value 1.
Answer: $(0, 1), (1, 3), (2, 5)$.

x	0	1	2
y			

Practice Problems

Show your thinking.

1. A tank starts with 2 L and gains 2 L/minute. Fill the table and graph. Use $y = 2x + 2$ for $x = 0, 1, 2$.

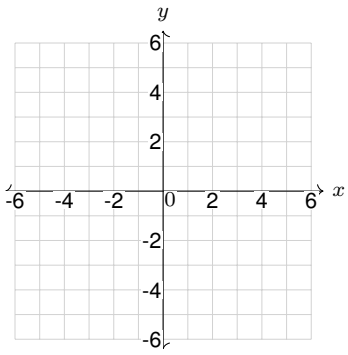


x	0	1	2
y			

2. A trip costs 4 dollars plus 3 per km. Build a cost table. Use $y = 3x + 4$ for $x = 0, 1, 2$.

x	0	1	2
y			

3. A plant starts at 3 cm and grows 1 cm/week. Model heights and graph. Use $y = 1x + 3$ for $x = 0, 1, 2$.



x	0	1	2
y			

4. A printer makes 5 pages/minute. Show the table. Use $y = 5x + 0$ for $x = 0, 1, 2$.

x	0	1	2
y			

5. A fund starts at 5 dollars and grows 2 per sale. Recover the outputs. Use $y = 2x + 5$ for $x = 0, 1, 2$.

x	0	1	2
y			

6. A tile rule adds 1 to triple the stage number. Correct outputs $0, 3, 6$. Use $y = 3x + 1$ for $x = 0, 1, 2$.

x	0	1	2
y			

Answer Key

1. $(0, 2), (1, 4), (2, 6)$.
2. $(0, 4), (1, 7), (2, 10)$.
3. $(0, 3), (1, 4), (2, 5)$.
4. $(0, 0), (1, 5), (2, 10)$.
5. $(0, 5), (1, 7), (2, 9)$.
6. $(0, 1), (1, 4), (2, 7)$.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. At $x = 0$, $y = 2 \times 0 + 2 = 2$.
2. At $x = 1$, $y = 2 \times 1 + 2 = 4$; at $x = 2$, $y = 2 \times 2 + 2 = 6$.
3. Each unit increase in x changes y by 2, with starting value 2.

Problem 2

1. At $x = 0$, $y = 3 \times 0 + 4 = 4$.
2. At $x = 1$, $y = 3 \times 1 + 4 = 7$; at $x = 2$, $y = 3 \times 2 + 4 = 10$.
3. Each unit increase in x changes y by 3, with starting value 4.

Problem 3

1. At $x = 0$, $y = 1 \times 0 + 3 = 3$.
2. At $x = 1$, $y = 1 \times 1 + 3 = 4$; at $x = 2$, $y = 1 \times 2 + 3 = 5$.
3. Each unit increase in x changes y by 1, with starting value 3.

Problem 4

1. At $x = 0$, $y = 5 \times 0 + 0 = 0$.
2. At $x = 1$, $y = 5 \times 1 + 0 = 5$; at $x = 2$, $y = 5 \times 2 + 0 = 10$.
3. Each unit increase in x changes y by 5, with starting value 0.

Problem 5

1. At $x = 0$, $y = 2 \times 0 + 5 = 5$.
2. At $x = 1$, $y = 2 \times 1 + 5 = 7$; at $x = 2$, $y = 2 \times 2 + 5 = 9$.
3. Each unit increase in x changes y by 2, with starting value 5.

Problem 6

1. At $x = 0$, $y = 3 \times 0 + 1 = 1$.
2. At $x = 1$, $y = 3 \times 1 + 1 = 4$; at $x = 2$, $y = 3 \times 2 + 1 = 7$.
3. Each unit increase in x changes y by 3, with starting value 1.

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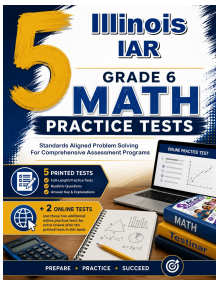

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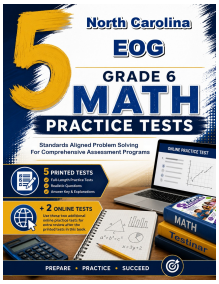

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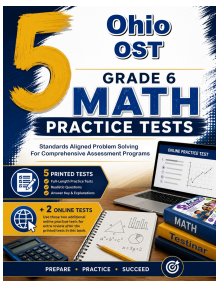

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