

AT A LOCAL PRINT SHOP, 15 COPIES CAN BE MADE FOR \$6. AT THIS RATE, HOW MANY COPIES COULD BE MADE FOR \$38? FILL

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UNDERSTANDING HOW TO DETERMINE THE NUMBER OF COPIES POSSIBLE WITHIN A GIVEN BUDGET IS A COMMON PROBLEM IN PRACTICAL MATH. WHEN DEALING WITH PRINTING COSTS, KNOWING THE RATE PER COPY HELPS YOU MANAGE EXPENSES EFFECTIVELY, WHETHER FOR PERSONAL PROJECTS, BUSINESS MATERIALS, OR SCHOOL ASSIGNMENTS. IN THIS ARTICLE, WE'LL EXPLORE HOW TO CALCULATE THE NUMBER OF COPIES YOU CAN GET FOR A SPECIFIC AMOUNT OF MONEY BASED ON A KNOWN RATE, USING THE EXAMPLE WHERE 15 COPIES COST \$6. WE'LL ALSO CONSIDER HOW TO APPLY THIS CALCULATION TO DIFFERENT BUDGETS, SUCH AS \$38, AND DISCUSS RELATED CONCEPTS LIKE UNIT RATES, PROPORTIONAL REASONING, AND PROBLEM-SOLVING STRATEGIES.

UNDERSTANDING THE BASIC COST-PER-COPY RATE

BEFORE JUMPING INTO CALCULATIONS, IT'S IMPORTANT TO UNDERSTAND WHAT THE COST-PER-COPY RATE MEANS. IN THIS SCENARIO, THE PRINT SHOP CHARGES A FIXED AMOUNT FOR A CERTAIN NUMBER OF COPIES.

GIVEN DATA

- 15 COPIES COST \$6

CALCULATING THE RATE PER COPY

TO FIND THE COST PER INDIVIDUAL COPY, DIVIDE THE TOTAL COST BY THE NUMBER OF COPIES:

$$\text{Cost per Copy} = \frac{\text{Total Cost}}{\text{Number of Copies}}$$

APPLYING THE GIVEN DATA:

$$\text{Cost per Copy} = \frac{6}{15} = 0.4$$

THIS MEANS EACH COPY COSTS \$0.40.

DETERMINING HOW MANY COPIES CAN BE MADE FOR A DIFFERENT BUDGET

ONCE YOU KNOW THE COST PER COPY, YOU CAN DETERMINE HOW MANY COPIES CAN BE MADE FOR ANY AMOUNT OF MONEY BY DIVIDING THE TOTAL BUDGET BY THE COST PER COPY.

CALCULATING FOR \$38

USING THE COST PER COPY:

$$\text{NUMBER OF COPIES} = \frac{\text{TOTAL BUDGET}}{\text{COST PER COPY}}$$

PLUGGING IN THE VALUES:

$$\text{NUMBER OF COPIES} = \frac{38}{0.4} = 95$$

THEREFORE, FOR \$38, YOU CAN MAKE 95 COPIES AT THIS RATE.

STEP-BY-STEP CALCULATION PROCESS

HERE'S AN ORGANIZED PROCESS TO SOLVE SIMILAR PROBLEMS:

1. IDENTIFY THE KNOWN QUANTITIES:
 - NUMBER OF COPIES FOR A GIVEN COST
 - TOTAL COST FOR THOSE COPIES
2. CALCULATE THE UNIT RATE:
 - $\text{COST PER COPY} = \frac{\text{TOTAL COST}}{\text{NUMBER OF COPIES}}$
3. DETERMINE THE TOTAL COPIES FOR THE DESIRED BUDGET:
 - $\text{NUMBER OF COPIES} = \frac{\text{DESIRED BUDGET}}{\text{COST PER COPY}}$
4. PERFORM THE DIVISION CAREFULLY, ENSURING CORRECT ROUNDING IF NECESSARY.

APPLYING THE CONCEPT TO DIFFERENT SCENARIOS

THIS METHOD CAN BE USED FOR VARIOUS SITUATIONS INVOLVING PROPORTIONAL REASONING AND UNIT RATES.

EXAMPLE 1: IF 20 COPIES COST \$8, HOW MANY COPIES CAN BE MADE FOR \$50?

SOLUTION:

- CALCULATE THE COST PER COPY:

$$\frac{8}{20} = 0.4$$

- DETERMINE THE NUMBER OF COPIES FOR \$50:

$$\frac{50}{0.4} = 125$$

ANSWER: 125 COPIES.

EXAMPLE 2: IF A PRINT SHOP OFFERS A SPECIAL RATE OF 10 COPIES FOR \$5, HOW MANY COPIES CAN BE MADE FOR \$38?

SOLUTION:

- COST PER COPY:

$$\left[\frac{5}{10} = 0.5 \right]$$

- NUMBER OF COPIES FOR \$38:

$$\left[\frac{38}{0.5} = 76 \right]$$

ANSWER: 76 COPIES.

UNDERSTANDING PROPORTIONAL RELATIONSHIPS

THE KEY IDEA BEHIND THESE CALCULATIONS IS PROPORTIONALITY. THE RATIO OF COST TO NUMBER OF COPIES REMAINS CONSTANT WHEN THE RATE IS FIXED.

PROPORTIONALITY PRINCIPLE:

$$\left[\frac{\text{Cost}_1}{\text{Copies}_1} = \frac{\text{Cost}_2}{\text{Copies}_2} \right]$$

APPLYING THIS PRINCIPLE HELPS VERIFY CALCULATIONS AND UNDERSTAND HOW CHANGING ONE QUANTITY AFFECTS THE OTHER.

ADDITIONAL TIPS FOR ACCURATE CALCULATIONS

- ALWAYS CONFIRM THE UNIT RATE BEFORE CALCULATING THE NUMBER OF COPIES.
- USE PRECISE DIVISION TO AVOID ROUNDING ERRORS.
- WHEN NECESSARY, ROUND DOWN TO THE NEAREST WHOLE COPY, SINCE PARTIAL COPIES ARE NOT POSSIBLE.
- CHECK CALCULATIONS BY MULTIPLYING THE NUMBER OF COPIES BY THE COST PER COPY TO ENSURE IT DOES NOT EXCEED THE BUDGET.

REAL-WORLD APPLICATIONS OF COST-PER-COPY CALCULATIONS

UNDERSTANDING THESE CALCULATIONS IS USEFUL BEYOND PRINTING:

- ESTIMATING PRINTING COSTS FOR LARGE PROJECTS
- BUDGETING FOR PROMOTIONAL MATERIALS
- PLANNING FOR SCHOOL OR BUSINESS PRINTING NEEDS
- COMPARING PRICES BETWEEN DIFFERENT PRINT SHOPS

CONCLUSION

CALCULATING HOW MANY COPIES CAN BE MADE WITHIN A SPECIFIC BUDGET IS STRAIGHTFORWARD ONCE YOU UNDERSTAND THE UNIT RATE AND PROPORTIONAL RELATIONSHIPS. STARTING WITH THE KNOWN COST FOR A SET NUMBER OF COPIES, YOU CAN DETERMINE THE COST PER COPY AND THEN APPLY THIS RATE TO ANY BUDGET. IN THE EXAMPLE GIVEN, WITH 15 COPIES COSTING \$6, EACH COPY COSTS \$0.40. THEREFORE, WITH \$38, YOU CAN MAKE 95 COPIES. THIS APPROACH NOT ONLY SIMPLIFIES BUDGETING BUT ALSO ENHANCES YOUR PROBLEM-SOLVING SKILLS IN EVERYDAY FINANCIAL DECISIONS RELATED TO PRINTING AND OTHER SERVICES.

SUMMARY OF KEY STEPS

- FIND THE COST PER COPY: $\text{TOTAL COST} / \text{NUMBER OF COPIES}$

- USE THE COST PER COPY TO FIND TOTAL COPIES FOR A NEW BUDGET: $\text{BUDGET} / \text{COST PER COPY}$
- ALWAYS VERIFY YOUR CALCULATIONS AND CONSIDER ROUNDING APPROPRIATELY.

BY MASTERING THESE SIMPLE YET POWERFUL STEPS, YOU CAN EFFICIENTLY PLAN AND BUDGET FOR PRINTING NEEDS OR ANY OTHER SCENARIO INVOLVING PROPORTIONAL COSTS.

FREQUENTLY ASKED QUESTIONS

WHAT IS THE COST PER COPY AT THE LOCAL PRINT SHOP?

THE COST PER COPY IS \$6 DIVIDED BY 15 COPIES, WHICH EQUALS \$0.40 PER COPY.

HOW MANY COPIES CAN BE MADE WITH \$38 AT THIS RATE?

WITH \$38, THE NUMBER OF COPIES IS \$38 DIVIDED BY \$0.40 PER COPY, WHICH EQUALS 95 COPIES.

IF 15 COPIES COST \$6, HOW MUCH WOULD 30 COPIES COST?

SINCE 15 COPIES COST \$6, 30 COPIES WOULD COST \$6 TIMES 2, WHICH IS \$12.

WHAT IS THE UNIT RATE FOR COPYING AT THE SHOP?

THE UNIT RATE IS \$0.40 PER COPY.

HOW MANY COPIES CAN BE MADE FOR \$24?

FOR \$24, THE NUMBER OF COPIES IS \$24 DIVIDED BY \$0.40, WHICH EQUALS 60 COPIES.

IF YOU WANT TO MAKE 50 COPIES, HOW MUCH WILL IT COST?

MAKING 50 COPIES AT \$0.40 EACH WILL COST 50 TIMES \$0.40, WHICH IS \$20.

WHAT IS THE TOTAL COST FOR MAKING 100 COPIES?

AT \$0.40 PER COPY, 100 COPIES WILL COST 100 TIMES \$0.40, WHICH IS \$40.

IF YOU HAVE A BUDGET OF \$38, HOW MANY COPIES CAN YOU MAKE WITHOUT EXCEEDING THE BUDGET?

YOU CAN MAKE UP TO 95 COPIES, SINCE 95 TIMES \$0.40 EQUALS \$38.

ARE THE PRICES AT THE PRINT SHOP PROPORTIONAL TO THE NUMBER OF COPIES?

YES, BECAUSE THE COST PER COPY REMAINS CONSTANT AT \$0.40, INDICATING A PROPORTIONAL RELATIONSHIP.

HOW DO YOU FIND THE NUMBER OF COPIES YOU CAN MAKE GIVEN A TOTAL AMOUNT OF MONEY?

DIVIDE THE TOTAL AMOUNT OF MONEY BY THE COST PER COPY TO FIND THE NUMBER OF COPIES YOU CAN MAKE.

ADDITIONAL RESOURCES

AT A LOCAL PRINT SHOP, 15 COPIES CAN BE MADE FOR \$6. AT THIS RATE, HOW MANY COPIES COULD BE MADE FOR \$38? THIS QUESTION PRESENTS A CLASSIC EXAMPLE OF PROPORTIONAL REASONING, A FUNDAMENTAL CONCEPT IN MATHEMATICS THAT HELPS US UNDERSTAND RELATIONSHIPS BETWEEN QUANTITIES. UNDERSTANDING HOW TO SOLVE

SUCH PROBLEMS NOT ONLY ENHANCES MATHEMATICAL LITERACY BUT ALSO PROVIDES PRACTICAL SKILLS APPLICABLE IN REAL-WORLD SCENARIOS, SUCH AS BUDGETING, PLANNING, AND RESOURCE ALLOCATION.

IN THIS COMPREHENSIVE ANALYSIS, WE WILL EXPLORE THE PROBLEM THOROUGHLY, BREAKING DOWN EACH STEP TO ENSURE CLARITY AND UNDERSTANDING. WE WILL EXAMINE THE CONCEPTS OF UNIT RATE, PROPORTIONALITY, AND HOW TO EXTEND THESE PRINCIPLES TO DETERMINE THE TOTAL NUMBER OF COPIES THAT CAN BE MADE FOR A DIFFERENT AMOUNT OF MONEY. OUR DISCUSSION WILL ALSO INCLUDE DETAILED EXPLANATIONS, EXAMPLES, AND THE REASONING BEHIND EACH STEP, MAKING IT ACCESSIBLE FOR LEARNERS AT VARIOUS LEVELS.

UNDERSTANDING THE PROBLEM

BEFORE JUMPING INTO CALCULATIONS, IT IS CRUCIAL TO UNDERSTAND WHAT THE PROBLEM ASKS AND IDENTIFY THE KEY INFORMATION PROVIDED.

KEY INFORMATION:

- RATE OF COPYING: 15 COPIES FOR \$6
- QUESTION: HOW MANY COPIES CAN BE MADE FOR \$38?

WHAT IS BEING ASKED?

THE PROBLEM SEEKS TO DETERMINE THE TOTAL NUMBER OF COPIES THAT CAN BE PRODUCED AT THE GIVEN RATE WHEN THE BUDGET INCREASES FROM \$6 TO \$38. ESSENTIALLY, IT ASKS US TO FIND THE TOTAL COPIES POSSIBLE WITHIN A LARGER BUDGET, GIVEN A KNOWN COST PER SET NUMBER OF COPIES.

WHY IS THIS PROBLEM IMPORTANT?

THIS TYPE OF PROBLEM EMPHASIZES THE CONCEPT OF UNIT RATE CALCULATIONS AND PROPORTIONAL RELATIONSHIPS. IT IS COMMON IN VARIOUS REAL-WORLD CONTEXTS, SUCH AS ESTIMATING PRINTING COSTS, SCALING RECIPES, OR BUDGETING FOR SUPPLIES.

BREAKING DOWN THE PROBLEM: STEP-BY-STEP APPROACH

TO SOLVE THIS PROBLEM EFFICIENTLY, A SYSTEMATIC APPROACH IS ESSENTIAL. THE PROCESS INVOLVES UNDERSTANDING THE RATE, FINDING THE UNIT COST, AND THEN APPLYING THIS TO THE NEW BUDGET.

STEP 1: FIND THE COST PER COPY

THE FIRST STEP IS TO DETERMINE HOW MUCH EACH COPY COSTS BASED ON THE GIVEN RATE.

- GIVEN: 15 COPIES COST \$6
- FIND: COST PER COPY

CALCULATION:

$$\begin{aligned} \text{Cost per copy} &= \frac{\text{Total cost}}{\text{Number of copies}} \\ &= \frac{6}{15} = 0.4 \end{aligned}$$

So, each copy costs \$0.40.

STEP 2: UNDERSTAND THE RATE

THIS INDICATES THAT THE PRINT SHOP CHARGES \$0.40 FOR EACH COPY, REGARDLESS OF THE TOTAL NUMBER MADE. RECOGNIZING THE UNIT RATE SIMPLIFIES CALCULATIONS AND ALLOWS US TO SCALE UP OR DOWN DEPENDING ON THE AVAILABLE BUDGET.

STEP 3: CALCULATE THE NUMBER OF COPIES FOR A NEW BUDGET

NOW, WITH THE UNIT COST KNOWN, WE CAN DETERMINE HOW MANY COPIES CAN BE MADE WITH \$38.

- TOTAL AVAILABLE MONEY: \$38

- COST PER COPY: \$0.40

CALCULATION:

$$\begin{aligned} & \backslash[\\ & \backslash\text{TEXT}\{\text{NUMBER OF COPIES}\} = \backslash\text{FRAC}\{\backslash\text{TEXT}\{\text{TOTAL MONEY}\}\}\{\backslash\text{TEXT}\{\text{COST PER COPY}\}\} = \backslash\text{FRAC}\{38\}\{0.4\} \\ & \backslash] \end{aligned}$$

CALCULATING THIS:

$$\begin{aligned} & \backslash[\\ & \backslash\text{FRAC}\{38\}\{0.4\} = 95 \\ & \backslash] \end{aligned}$$

THEREFORE, 95 COPIES CAN BE MADE FOR \$38 AT THIS RATE.

ALTERNATIVE METHOD: USING PROPORTIONALITY

WHILE THE ABOVE METHOD IS STRAIGHTFORWARD, IT'S VALUABLE TO UNDERSTAND AN ALTERNATIVE APPROACH ROOTED IN PROPORTIONAL REASONING, WHICH IS ESPECIALLY USEFUL FOR MORE COMPLEX OR LESS DIRECT PROBLEMS.

STEP 1: SET UP A PROPORTION

THE INITIAL RATE PROVIDES A RATIO:

$$\begin{aligned} & \backslash[\\ & \backslash\text{FRAC}\{15 \backslash\text{TEXT}\{\text{COPIES}\}\}\{6 \backslash\text{TEXT}\{\text{DOLLARS}\}\} \\ & \backslash] \end{aligned}$$

WE WANT TO FIND THE NUMBER OF COPIES $\backslash(x\backslash)$ THAT CAN BE MADE WITH \$38:

$$\begin{aligned} & \backslash[\\ & \backslash\text{FRAC}\{15\}\{6\} = \backslash\text{FRAC}\{x\}\{38\} \end{aligned}$$

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STEP 2: SOLVE FOR (x)

CROSS-MULTIPLIED, THE PROPORTION BECOMES:

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$$15 \times 38 = 6 \times x$$

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CALCULATING:

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$$15 \times 38 = 570$$

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NOW, SOLVE FOR (x) :

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$$x = \frac{570}{6} = 95$$

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AGAIN, WE FIND 95 COPIES.

ADVANTAGES OF PROPORTIONALITY

- IT DIRECTLY RELATES THE QUANTITIES WITHOUT CALCULATING THE UNIT COST EXPLICITLY.
- IT'S PARTICULARLY USEFUL WHEN RATES ARE NOT CONSTANT OR WHEN DEALING WITH MORE COMPLEX RELATIONSHIPS.

PRACTICAL APPLICATIONS AND REAL-WORLD RELEVANCE

UNDERSTANDING HOW TO APPLY PROPORTIONAL REASONING TO SUCH PROBLEMS HAS NUMEROUS PRACTICAL APPLICATIONS:

BUDGETING AND COST ESTIMATION

- BUSINESSES CAN ESTIMATE PRINTING COSTS BASED ON INITIAL RATES.
- STUDENTS OR PROFESSIONALS CAN PLAN PROJECTS WITHIN SPECIFIC BUDGETS.
- CONSUMERS CAN COMPARE PRICES ACROSS DIFFERENT VENDORS.

RESOURCE MANAGEMENT

- DETERMINING HOW MUCH MATERIAL, SUPPLIES, OR TIME IS NEEDED FOR LARGER OR SMALLER PROJECTS.
- SCALING RECIPES OR FORMULAS IN COOKING, CHEMISTRY, OR ENGINEERING.

EDUCATIONAL VALUE

- DEVELOPING CRITICAL THINKING AND PROBLEM-SOLVING SKILLS.
- BUILDING FOUNDATIONAL KNOWLEDGE FOR ADVANCED MATHEMATICS.

POTENTIAL VARIATIONS AND EXTENDED PROBLEMS

TO DEEPEN UNDERSTANDING, CONSIDER EXPLORING RELATED PROBLEMS:

- VARIABLE RATES: WHAT IF THE COST PER COPY CHANGES WITH VOLUME? FOR EXAMPLE, DISCOUNTS FOR LARGER ORDERS.
- DIFFERENT COST STRUCTURES: SUPPOSE THE SHOP CHARGES A FLAT FEE PLUS PER-COPY COST.
- MULTIPLE QUANTITIES: HOW MANY COPIES CAN BE MADE IF THE COST PER COPY VARIES BASED ON QUANTITY?

THESE VARIATIONS INTRODUCE ADDITIONAL COMPLEXITY BUT ALSO REINFORCE CORE CONCEPTS LIKE PROPORTIONALITY AND UNIT RATES.

SUMMARY AND CONCLUSION

THE PROBLEM OF DETERMINING HOW MANY COPIES CAN BE MADE FOR A GIVEN AMOUNT OF MONEY AT A SPECIFIC RATE HIGHLIGHTS THE IMPORTANCE OF UNDERSTANDING PROPORTIONAL RELATIONSHIPS AND UNIT COSTS. THE KEY STEPS INVOLVE CALCULATING THE COST PER COPY FROM THE INITIAL DATA, THEN APPLYING THIS TO THE NEW BUDGET.

FINAL ANSWER: FOR \$38, AT THE RATE OF 15 COPIES FOR \$6, YOU CAN MAKE 95 COPIES.

THIS PROBLEM EXEMPLIFIES FUNDAMENTAL PRINCIPLES OF MATHEMATICS THAT ARE BOTH THEORETICALLY INTERESTING AND PRACTICALLY APPLICABLE. MASTERING THESE CONCEPTS EMPOWERS INDIVIDUALS TO MAKE INFORMED DECISIONS, PLAN BUDGETS EFFECTIVELY, AND DEVELOP CRITICAL THINKING SKILLS NECESSARY FOR TACKLING MORE COMPLEX REAL-WORLD PROBLEMS.

IN ESSENCE, THE ABILITY TO CONVERT RATES AND PROPORTIONS INTO ACTIONABLE INSIGHTS IS A VITAL SKILL—ONE THAT SEAMLESSLY INTEGRATES MATHEMATICAL REASONING WITH EVERYDAY LIFE.

[AT A LOCAL PRINT SHOP 15 COPIES CAN BE MADE FOR 6 AT THIS RATE HOW MANY COPIES COULD BE MADE FOR 38 FILL](#)

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