Small steps in Direct Proportion

Each question takes you through how to form a direct proportion equation, gradually decreasing the support.

Example

W is directly proportional to V. When W = 42, V = 7. Find W when V = 10.

Basic statement: $W \propto V$

Proportion equation: $W = kV$

Substitute to find k: $42 = k \times 7$

                                        $k = 42 \div 7 = 6$

State equation: $W = 6V$

Use equation to solve the problem: V = 10 $W = 6 \times 10 = \mathbf{60}$

Questions: Fill in the gaps

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1. T is directly proportional to C. When T = 14, C = 3.5. Find T when C = 8.
Basic statement: $T \propto C$
Proportion equation: $T = kC$
Substitute to find k: $14 = k \times 3.5$
                                        $k = 14 \div 3.5 = 4$
State equation: $T = 4C$
Use equation to solve the problem: C = 8 $T = 4 \times \underline{\ \ } = \underline{\ \ }$

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2. x varies directly with t. When x = 15, t = 6. Find x when t = 6.
Basic statement: $x \propto t$
Proportion equation: $x = kt$
Substitute to find k: $15 = k \times 6$
                                        $k = 15 \div 6 = 2.5$
State equation: $x = 2.5t$
Use equation to solve the problem: t = 6 $x = \underline{\ \ } \times \underline{\ \ } = \underline{\ \ }$

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3. A is in direct to proportion to B. When A = -12, B = 4. Find A when B = 9.
Basic statement: $A \propto B$
Proportion equation: $A = kB$
Substitute to find k: $-12 = k \times 4$
                                        $k = -12 \div 4 = \underline{\ \ }$
State equation: $A = \underline{\ \ }B$
Use equation to solve the problem: B = 9 $A = \underline{\ \ } \times \underline{\ \ } = \underline{\ \ }$

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4. J varies in proportion to M. When J = 2, M = 20. Find J when M = 13.

Basic statement: $J \propto M$

Proportion equation: $J = k\,M$

Substitute to find k: $2 = k \times 20$

                                        $k = \underline{} \div \underline{} = \underline{}$

State equation: $J = \underline{}$

Use equation to solve the problem: M = 13   J = _____

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5. P is directly proportional to Q. When P = 360, Q = 90. Find P when Q = 15.

Basic statement: $P \propto Q$

Proportion equation: $P = k\,Q$

Substitute to find k: $\underline{} = k \times \underline{}$

                                          $k = \underline{} \div \underline{} = \underline{}$

State equation: $P = \underline{}$

Use equation to solve the problem: Q = __   P = _____

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6. m is in proportional to r. When m = ½ , r = ¼ . Find m when r = ¾ .

Basic statement: $m \propto r$

Proportion equation: $m = \underline{}$

Substitute to find k: $\underline{} = k \times \underline{}$

                                          $k = \underline{} \div \underline{} = \underline{}$

State equation: $\underline{}$

Use equation to solve the problem: $\underline{} = \underline{}$ $\underline{} = \underline{}$

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7. y is directly proportional to x. When y = 72, x = 48. Find y when x = 15.

Basic statement: $\underline{} \propto \underline{}$

Proportion equation: $y = \underline{}$

Substitute to find k: $\underline{} = k \times \underline{}$

                                          $k = \underline{} \div \underline{} = \underline{}$

State equation:

Use equation to solve the problem:

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8. E varies directly with to G. When E = -18, G = -3. Find E when G = 7.

Basic statement:

Proportion equation:

Substitute to find k:

State equation:

Use equation to solve the problem:

Now consider how to use this structure to solve other direct proportion questions.

Extension: How can you adapt this technique for problems such as "y is proportional to the square of x. When y is 75, x is 5. Find the value of y when x is 7"

Small steps in Direct Proportion: Solutions

1. 32
2. 15
3. -27
4. 1.3
5. 60
6. 1.5
7. 22.5
8. 42