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 ∝ V

Proportion equation: W = k V

Substitute to find k: 42 = k × 7

k = 42 ÷ 7 = 6

State equation: W = 6V

Use equation to solve the problem: V = 10 W = 6 × 10 = **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 ∝ C  Proportion equation: T = k C  Substitute to find k: 14 = k × 3.5  k = 14 ÷ 3.5 = 4  State equation: T = 4C  Use equation to solve the problem: C = 8 T = 4 × \_\_ = \_\_  2. x varies directly with t. When x = 15, t = 6. Find x when t = 6.  Basic statement: x ∝ t  Proportion equation: x = k t  Substitute to find k: 15 = k × 6  k = 15 ÷ 6 = 2.5  State equation: x = 2.5t  Use equation to solve the problem: t = 6 x = \_\_ × \_\_ = \_\_ |
| 3. A is in direct to proportion to B. When A = -12, B = 4. Find A when B = 9.  Basic statement: A ∝ B  Proportion equation: A = k B  Substitute to find k: -12 = k × 4  k = -12 ÷ 4 = \_\_  State equation: A = \_\_B  Use equation to solve the problem: B = 9 A = \_\_ × \_\_ = \_\_ |
| 4. J varies in proportion to M. When J = 2, M = 20. Find J when M = 13.  Basic statement: J ∝ M  Proportion equation: J = k M  Substitute to find k: 2 = k × 20  k = \_\_ ÷ \_\_ = \_\_  State equation: J = \_\_\_\_\_  Use equation to solve the problem: M = 13 J = \_\_\_\_\_\_\_\_\_\_\_\_\_ |
| 5. P is directly proportional to Q. When P = 360, Q = 90. Find P when Q = 15.  Basic statement: P ∝ Q  Proportion equation: P = k Q  Substitute to find k: \_\_ = k × \_\_  k = \_\_ ÷ \_\_ = \_\_  State equation: P = \_\_\_\_\_\_  Use equation to solve the problem: Q = \_\_ P = \_\_\_\_\_\_\_\_\_\_\_\_ |
| 6. m is in proportional to r. When m = ½ , r = ¼ . Find m when r = ¾ .  Basic statement: m ∝ r  Proportion equation: m = \_\_\_\_\_\_\_\_  Substitute to find k: \_\_ = k × \_\_  k = \_\_ ÷ \_\_ = \_\_  State equation: \_\_\_\_\_\_\_\_\_\_\_\_\_  Use equation to solve the problem: \_\_ = \_\_ \_\_ = \_\_\_\_\_\_\_\_\_\_\_ |
| 7. y is directly proportional to x. When y = 72, x = 48. Find y when x = 15.  Basic statement: \_\_ ∝ \_\_  Proportion equation: y = \_\_\_\_\_\_\_\_  Substitute to find k: \_\_ = k × \_\_  k = \_\_ ÷ \_\_ = \_\_  State equation:  Use equation to solve the problem: |
| 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