

Inverse Variation Bell Work

Solve problem involving Inverse Variation.

Given that $y \propto \frac{1}{x}$. Calculate the constant of variation in each case then fill in the missing values.

1.

| | | | | | |
|---|----|----|----|----|---|
| X | 10 | 25 | | | 1 |
| Y | 5 | | 10 | 20 | |

2.

| | | | | | |
|---|---|----|----|----|---|
| X | 8 | 24 | | 16 | |
| Y | 6 | | 12 | | 1 |

3. If y is inversely proportional to x, and $y = 24$ when $x = 6$, find y when $x = 8$.

4. If y varies inversely as x, and $y = 24$ when $x = 8$, find x when $y = 10$.

5. If M varies inversely as N, and $M = 2$ when $N = 5$. Find the constant of variation.

6. If y varies inversely as $(x-3)$, and $y = 5$ when $x = 7$, find y when $x = 5$.

7. Fifteen men can complete a job in 6 days. How many extra men will be required if the job is completed in 5 days?

Name: _____ Period: _____ Date: _____

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8. When travelling at 60 km/h, a car takes 2 hours to go from city A to city B. If a second car traveling at 40 km/ h, how long would it take to go from city A to B?

9. Five boy scouts are going on a camping trip and they have bought enough food for 6 days. If one extra Boy Scout joins then for a trip, how long will the food will last?

10. The time required to empty a tank varies inversely as the rate r of pumping. If a pump can empty a tank in 45 min at the rate of 600 kilometers per minute (kl/min), how long will it take the pump to empty the same tank at the rate of 1000 kl/min?

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Answer:

Solve problem involving Inverse Variation.

Given that $y \propto \frac{1}{x}$. Calculate the constant of variation in each case then fill in the missing values.

1.

| | | | | | |
|---|----|----|----|-----|----|
| X | 10 | 25 | 5 | 2.5 | 1 |
| Y | 5 | 2 | 10 | 20 | 50 |

Solution:

$$5 = \frac{k}{10} \quad k = 10(5) \quad k = 50$$

$$y = \frac{50}{25} = 2 \quad x = \frac{50}{10} = 5 \quad x = \frac{50}{20} = 2.5 \quad y = \frac{50}{1} = 50$$

2.

| | | | | | |
|---|---|----------------|----------------|----------------|----|
| X | 8 | 24 | $3\frac{1}{3}$ | 16 | 40 |
| Y | 6 | $1\frac{2}{3}$ | 12 | $2\frac{1}{2}$ | 1 |

Solution:

$$5 = \frac{k}{8} \quad k = 5(8) = 40$$

$$y = \frac{40}{24} = 1\frac{2}{3} \quad x = \frac{40}{12} = 3\frac{1}{3} \quad y = \frac{40}{16} = 2\frac{1}{2} \quad x = \frac{40}{1} = 40$$

3. If y is inversely proportional to x, and y = 24 when x = 6, find y when x = 8.

Solution:

$$24 = \frac{k}{6} \quad k = 24(6) \quad k = 144 \quad y = \frac{144}{8} = 18$$

4. If y varies inversely as x, and y = 24 when x = 8, find x when y = 10.

Solution:

$$24 = \frac{k}{8} \quad k = 24(8) \quad k = 192 \quad x = \frac{192}{10} = 19\frac{1}{5}$$

5. If M varies inversely as N, and M = 2 when N = 5. Find the constant of variation.

Solution:

$$M = \frac{k}{N} \quad 2 = \frac{k}{5} \quad k = 2(5) \quad k = 10$$

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6. If y varies inversely as $(x-3)$, and $y = 5$ when $x = 7$, find y when $x = 5$.

Solution:

$$y = \frac{k}{(x-3)} \quad y = \frac{k}{(x-3)} \quad k = 5(4) = 20 \quad y = \frac{20}{(5-3)} = 10$$

7. Fifteen men can complete a job in 6 days. How many extra men will be required if the job is completed in 5 days?

Solution:

| days | No. of Men |
|------|------------|
| 6 | 15 |
| 5 | ? |

$$6 = \frac{k}{15} \quad k = 6(15) = 90 \quad M = \frac{90}{5} = 18$$

The number of men needed to complete a job in 5 days is 18.

8. When travelling at 60 km/h, a car takes 2 hours to go from city A to city B. If a second car traveling at 40 km/h, how long would it take to go from city A to B?

Solution:

| speed | time |
|-------|------|
| 60 | 2 |
| 40 | ? |

$$2 = \frac{k}{60} \quad k = 2(60) = 120 \quad t = \frac{120}{40} = 3$$

The second car will takes 3 hours to travel city A to B.

9. Five boy scouts are going on a camping trip and they have bought enough food for 6 days. If one extra Boy Scout joins then for a trip, how long will the food will last?

Solution:

| days | Scout |
|------|-------|
| 6 | 5 |
| ? | 6 |

$$6 = \frac{k}{5} \quad k = 6(5) = 30 \quad d = \frac{30}{6} = 5$$

It will last for five days.

10. The time required to empty a tank varies inversely as the rate r of pumping. If a pump can empty a tank in 45 min at the rate of 600 kilometers per minute (kl/min), how long will it take the pump to empty the same tank at the rate of 1000 kl/min?

Solution:

| (kl/min) | Time (min) |
|----------|------------|
| 600 | 45 |
| 1000 | ? |

$$45 = \frac{k}{600} \quad k = (600)(45) = 27000 \quad t = \frac{27000}{1000} = 27$$

27 minutes