Percent Increase and Decrease

Apply the skill to decisions and designs

Name _____ **Date** _____ **Score** _____ / 8

QUICK REVIEW

The change fraction is |new − original|/original. Multiply this fraction by 100 to find the percent number, then attach $\%$. An increase from 50 to 60 has change fraction $10/50 = 0.20 = 20\%$. A 15% decrease multiplies the original by 0.85, not 0.15.

Worked example

Example changes from 50 to 60. Find the percent increase.

1. The change has size $|60 - 50| = 10$.
2. Use the original value: the percent-change number is $10/50 \times 100 = 20$, so this is a 20% increase.
3. Check: $50 + (20/100)(50) = 60$.
Answer: 20% increase.

Practice Problems

Show your thinking.

1. Attendance starts at 40 people and has a 25% increase. Find the new amount. Is it at least 48 people?

2. A conservation design uses 60 L after a 25% reduction. Model the unknown original use and find liters saved.

3. Enrollment starts at 120 students and has a 15% increase. Find the new amount. Is it at least 140 students?

4. Paper waste starts at 200 kg and has a 15% decrease. Find the new amount. Is it at most 175 kg?

5. A price of $160.00 rises 20% and then falls 20%. Does it return to its original price?

6. After a shop sells 25% of its notebooks, 90 notebooks remain. How many were there at the start and how many were sold?

7. Volunteer time starts at 64 hours and has a 25% increase. Find the new amount. Is it at least 80 hours?

8. After a 20% decrease, a price is 56 dollars. Find the original and decide whether the saving reaches 15 dollars.

Answer Key

1. 50 people; meets the target.
2. Original 80 L; saved 20 L.
3. 138 students; does not meet the target.
4. 170 kg; meets the target.
5. No; final price \$153.60, a 4% decrease.
6. Originally 120 notebooks; 30 sold.
7. 80 hours; meets the target.
8. Original 70 dollars; saved 14 dollars. Saving is 1 dollar below the goal.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Use the increase multiplier $1 + 0.25 = 1.25$.
2. New amount: $40(1.25) = 50$ people.
3. $50 > 48$, so the new amount meets the target.

Problem 2

1. After a 25% reduction, 75% remains: $0.75w = 60$.
2. $w = 60/0.75 = 80$ L.
3. Check $80 - 60 = 20$ L and $20/80 = 25\%$.

Problem 3

1. Use the increase multiplier $1 + 0.15 = 1.15$.
2. New amount: $120(1.15) = 138$ students.
3. $138 < 140$, so the new amount does not meet the target.

Problem 4

1. Use the decrease multiplier $1 - 0.15 = 0.85$.
2. New amount: $200(0.85) = 170$ kg.
3. $170 < 175$, so the new amount meets the target.

Problem 5

1. After the increase: $160(1.20) = 192$ dollars.
2. After the decrease: $192(0.80) = \frac{768}{5}$ dollars.
3. Net percent-change number: $(160 - \frac{768}{5})/160 \times 100 = 4$; therefore the final price is a 4% decrease from the original.

Problem 6

1. The remaining multiplier is $1 - 0.25 = 0.75$, so $0.75b = 90$.
2. Original stock: $b = 90/0.75 = 120$ notebooks.
3. Number sold: $120 - 90 = 30$ notebooks.

Problem 7

1. Use the increase multiplier $1 + 0.25 = 1.25$.
2. New amount: $64(1.25) = 80$ hours.
3. $80 = 80$, so the new amount meets the target.

Problem 8

1. The remaining multiplier is $1 - 0.20 = 0.80$, so $0.80p = 56$.
2. $p = 56/0.80 = 70$ dollars.
3. Saving $70 - 56 = 14$ dollars. Goal gap $15 - 14 = 1$ dollar.

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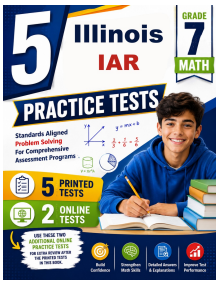

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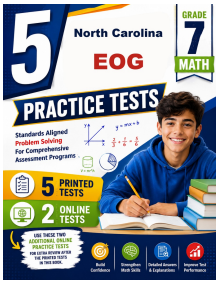

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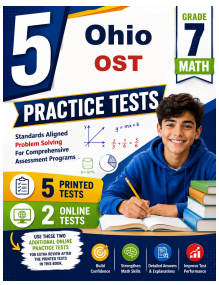

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