Percent Increase and Decrease

Spot mistakes, reason, and work backward

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 changes from 40 to 50. Lee divides the change by 50. Correct the percent-change calculation.

2. A student adds 25% of 60 L to undo a 25% decrease ending at 60 L. Recover the original using a multiplier equation.

3. Enrollment changes from 120 to 138. Lee divides the change by 138. Correct the percent-change calculation.

4. Paper waste changes from 200 to 170. Lee divides the change by 170. Correct the percent-change calculation.

5. A price of $140.00 rises 20% and then falls 20%. Does it return to its original price?

6. A restock increases the box count by 25% to 90 boxes. A clerk subtracts 25% of 90 to undo it. Find the original count and boxes added.

7. Volunteer hours changes from 64 to 80. Lee divides the change by 80. Correct the percent-change calculation.

8. A student adds 20% of 56 dollars to undo a 20% decrease. Use an equation to recover the original price.

Answer Key

1. 25% increase.
2. Original 80 L; saved 20 L.
3. 15% increase.
4. 15% decrease.
5. No; final price \$134.40, a 4% decrease.
6. Originally 72 boxes; added 18.
7. 25% increase.
8. Original 70 dollars; saved 14 dollars.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The change has size $|50 - 40| = 10$.
2. Use the original value: the percent-change number is $10/40 \times 100 = 25$, so this is a 25% increase.
3. Check: $40 + (25/100)(40) = 50$.

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. The change has size $|138 - 120| = 18$.
2. Use the original value: the percent-change number is $18/120 \times 100 = 15$, so this is a 15% increase.
3. Check: $120 + (15/100)(120) = 138$.

Problem 4

1. The change has size $|170 - 200| = 30$.
2. Use the original value: the percent-change number is $30/200 \times 100 = 15$, so this is a 15% decrease.
3. Check: $200 - (15/100)(200) = 170$.

Problem 5

1. After the increase: $140(1.20) = 168$ dollars.
2. After the decrease: $168(0.80) = \frac{672}{5}$ dollars.
3. Net percent-change number: $(140 - \frac{672}{5})/140 \times 100 = 4$; therefore the final price is a 4% decrease from the original.

Problem 6

1. The increase was based on the old count b: $1.25b = 90$.
2. Divide: $b = 90/1.25 = 72$ boxes, not $90(0.75) = 67.5$.
3. Added: $90 - 72 = 18$ boxes; check $72(0.25) = 18$.

Problem 7

1. The change has size $|80 - 64| = 16$.
2. Use the original value: the percent-change number is $16/64 \times 100 = 25$, so this is a 25% increase.
3. Check: $64 + (25/100)(64) = 80$.

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.

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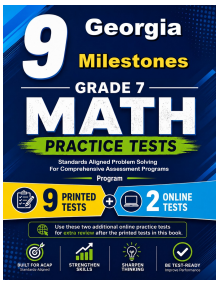

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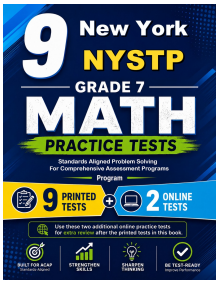

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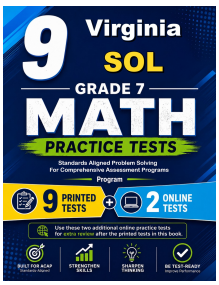

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