

Warm Up Grade 8

March 2, 2017 Finding the Percent Increase or Percent Decrease



* remember the original is always the first one**

$$\frac{\text{Difference}}{\text{Original}} \times 100$$

1. The width of the rectangle increased from 8 cm to 12 cm. Write the increase as a percent.

$$\begin{aligned} \text{Difference} &= \text{Big} - \text{Small} \\ &= 12\text{cm} - 8\text{cm} \\ &= 4\text{cm} \end{aligned}$$

$$\begin{aligned} &\frac{\text{Diff}}{\text{original}} \times 100 \quad \% \\ &= \frac{4\text{cm}}{8\text{cm}} \times 100 \quad \% \\ &= 0.5 \times 100 \quad \% \\ &= 50\% \end{aligned}$$

50% increase on width

2. The volume of water in the tank decreased from 40 L to 32 L. Write the decrease as a percent.

$$\begin{aligned} \text{Diff} &= 40\text{L} - 32\text{L} \\ &= 8\text{L} \end{aligned}$$

$$\boxed{\frac{\text{Diff}}{\text{orig}} \times 100 \quad \%}$$

must study

$$= \frac{8\text{L}}{40\text{L}} \times 100 \quad \%$$

$$= 0.2 \times 100 \quad \%$$

$$= 20\%$$

20% decrease in volume of water

Finding the Percent Increase or Percent Decrease

$$\frac{\text{Difference}}{\text{Original}} \times 100$$

***** Important

Percent Increase = $\frac{\text{Amount of Increase}}{\text{Original Amount}} \times 100\%$ (Amount of Increase = New Price - Original Price)

Percent Decrease = $\frac{\text{Amount of Decrease}}{\text{Original Amount}} \times 100\%$ (Amount of Decrease = Original Price - NewPrice)

$$\begin{aligned} 5. \text{ Amt of Inc} &= 10 - 5 \\ &= 5 \end{aligned}$$

$$\begin{aligned} \% \text{ Inc} &= \frac{\text{Amt of Inc}}{\text{Orig Amt}} \times 100\% \\ &= \frac{5}{5} \times 100\% \\ &= 100\% \end{aligned}$$

$$\begin{aligned} b) \text{ Amt of Inc} &= 12 - 8 \\ &= 4 \end{aligned}$$

$$\begin{aligned} \% \text{ Inc} &= \frac{\text{Amt of Inc}}{\text{Orig Amt}} \times 100\% \\ &= \frac{4}{8} \times 100\% \\ &= 0.5 \times 100\% \\ &= 50\% \end{aligned}$$

$$\begin{aligned} 6. \text{ Amt of Dec} &= 15 - 12 \\ &= 3 \end{aligned}$$

$$\begin{aligned} \% \text{ Dec} &= \frac{\text{Amt of Dec}}{\text{Orig Amt}} \times 100\% \\ &= \frac{3}{15} \times 100\% \\ &= 0.2 \times 100\% \\ &= 20\% \end{aligned}$$

$$\begin{aligned} b) \text{ Amt of Dec} &= 200 - 150 \\ &= 50 \end{aligned}$$

$$\begin{aligned} \text{Percent Dec} &= \frac{\text{Amt of Dec}}{\text{Orig Amt}} \times 100\% \\ &= \frac{50}{200} \times 100\% \\ &= 0.25 \times 100\% \\ &= 25\% \end{aligned}$$

$$\begin{aligned} \text{g. a) Amt of Inc} &= 344\,000 - 320\,000 \\ &= 24\,000 \end{aligned}$$

$$\begin{aligned} \% \text{ Inc} &= \frac{\text{Amt of Inc}}{\text{Orig Amt}} \times 100\% \\ &= \frac{24\,000}{320\,000} \times 100\% \\ &= 0.075 \times 100\% \\ &= 7.5\% \end{aligned}$$

$$\begin{aligned} \text{b) Amt of Inc} &= 99\,284 - 41\,715 \\ &= 57\,569 \end{aligned}$$

$$\begin{aligned} \% \text{ Inc} &= \frac{\text{Amt of Inc}}{\text{Orig Amt}} \times 100\% \\ &= \frac{57\,569}{41\,715} \times 100\% \\ &= 1.38 \times 100\% \\ &= 138\% \end{aligned}$$

$$9a) \text{ Amt of Dec} = 109.9 - 104.9 \\ = 5$$

$$\% \text{ Dec} = \frac{\text{Amt Dec}}{\text{Orig Amt}} \times 100\% \\ = \frac{5}{109.9} \times 100\% \\ = 0.0455 \times 100\% \\ = 4.55\%$$

$$b) \text{ Amt of Dec} = 17 - 10 \\ = 7$$

$$\% \text{ Dec} = \frac{\text{Amt of Dec}}{\text{Orig Amt}} = \frac{7}{17} \times 100\% \\ = 0.412 \times 100\% \\ = 41.2\%$$

10. 2001 \rightarrow 12% less miners

12% of miners in 1986

12% of 193 000

$$0.12 \times 193\,000$$

23 160 \rightarrow fewer miners

so in 2001

$$193\,000 - 23\,160$$

169 840 miners in 2001

$$11. \text{ Amt of Dec } \frac{55 - 12}{43}$$

$$\begin{aligned} \% \text{ Dec} &= \frac{\text{Amt of Dec}}{\text{Orig Amt}} \times 100\% \\ &= \frac{43}{55} \times 100\% \\ &= 0.782 \times 100\% \\ &= 78.2\% \text{ decrease} \end{aligned}$$

12. Jemma

$$\begin{array}{ll} \text{Week 1} & 15\% \text{ of } 1.5 \\ \text{Increase} & 0.15 \times 1.5 \\ & 0.225 \end{array}$$

$$\text{Mass after week 1} \rightarrow 1.5 + 0.225 = 1.725$$

$$\begin{array}{ll} \text{Week 2} & 15\% \text{ of } 1.725 \\ \text{Increase} & 0.15 \times 1.725 \\ & 0.25875 \end{array}$$

$$\begin{array}{ll} \text{Jemma's} & 1.725 + 0.25875 \\ \text{mass - Week 2} & \underline{1.98375 \text{ kg}} \end{array}$$

$$\begin{array}{ll} \text{George} & 30\% \text{ of } 1.5 \\ 30\% \text{ increase} & = 0.3 \times 1.5 \\ \text{in 2 weeks} & = 0.45 \end{array}$$

$$\begin{array}{ll} \text{Total mass} & 1.5 + 0.45 \\ & \underline{1.95 \text{ kg}} \end{array}$$

(b)

13. a) 24% of 693 000 (Increase)

$$0.24 \times 693\,000 \\ 166\,320$$

Pop. in	693 000 + 166 320
2000	859 320

b) 11% Increase in 2005

$$11\% \text{ of } 859\,320 \\ 0.11 \times 859\,320 \\ 94\,525.2$$

Pop in 2005 \rightarrow

$$859\,320 + 94\,525 \\ 953\,845$$

$$\begin{aligned} \text{c) Amt of Inc} &= 953\,845 - 693\,000 \\ &= 260\,845 \end{aligned}$$

$$\begin{aligned} \% \text{ Inc} &= \frac{\text{Amt of Inc}}{\text{Orig Amt}} \times 100\% \\ &= \frac{260\,845}{693\,000} \times 100\% \\ &= 0.376 \times 100\% \\ &= 37.6\% \end{aligned}$$

d)

• 15. a) $150 \text{ cm} = 90\%$ of n

90% of $n = 150 \text{ cm}$

$$\frac{\cancel{0.9} \times n}{\cancel{0.9}} = \frac{150}{\cancel{0.9}}$$

$$n = 166.7 \text{ cm}$$

b) 98% of $n = 176$

$$\frac{\cancel{0.98} \times n}{\cancel{0.98}} = \frac{176}{\cancel{0.98}}$$

$$n = 179.6$$

Class / Homework

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#16

boy: 90% of adult height is 148 cm at age 13, find adult height?

$$90\% \text{ of } A = 148$$

$$\frac{0.9 \times A}{0.9} = \frac{148}{0.9}$$

#14, #16, #17

Girl: 95% of adult height is 168 cm at age 13, find adult height?

$$A = 164.4 \text{ cm}$$

Extra Practice 1: # 1 to #7

Use your notes

1 a b c
 3 a b e
 4 a g
 5 a c e
 6
 7

5% of a number is 30

↓ change to decimal

$$0.50 \times N = 30$$

$$\frac{0.50 \times N = 30}{0.50} \quad \frac{30}{0.50}$$

divide on cal

$$N = 60$$

50% of # is 30

(x2) (x2)

100% of # = 60

$$14) \text{ Crime Rate}_{2004} = 15194$$

dec by 6% in 2005

by 4% in 2006

decrease in
Year 2005

$$\begin{aligned} &6\% \text{ of } 15194 \\ &0.06 \times 15194 \\ &= 911 \end{aligned}$$

$$\begin{aligned} &\text{New Crime Rate } 2005 \\ &15194 - 911 \end{aligned}$$

$$14283$$

Year 2006
decreased by 4%
of year 2005

$$\begin{aligned} &4\% \text{ of } 14283 \\ &0.04 \times 14283 \\ &= 571 \end{aligned}$$

$$\begin{aligned} &\text{New Crime Rate} \\ &\text{Year 2006} \\ &14283 - 571 \end{aligned}$$

$$= 13712$$

$$\begin{aligned} \text{Difference} &= 15194 - 13712 \\ &= 1482 \end{aligned}$$

$$= \frac{\text{Diff}}{\text{Orig}} \times 100 = \%$$

$$= \frac{1482}{15194} \times 100$$

$$= \frac{15194}{\text{divident fraction}} \times 100$$

$$= 9.75\%$$

13. a) 24% of 693 000 (Increase)

$$0.24 \times 693\,000 \\ 166\,320$$

Pop. in	693 000 + 166 320
2000	859 320

b) 11% Increase in 2005

$$11\% \text{ of } 859\,320 \\ 0.11 \times 859\,320 \\ 94\,525.2$$

Pop in 2005 \rightarrow

$$859\,320 + 94\,525 \\ 953\,845$$

$$\begin{aligned} \text{c) Amt of Inc} &= 953\,845 - 693\,000 \\ &= 260\,845 \end{aligned}$$

$$\begin{aligned} \% \text{ Inc} &= \frac{\text{Amt of Inc}}{\text{Orig Amt}} \times 100\% \\ &= \frac{260\,845}{693\,000} \times 100\% \\ &= 0.376 \times 100\% \\ &= 37.6\% \end{aligned}$$

d)

$$14. \text{ 2005 Dec } \quad 6\% \text{ of } 15\,194$$
$$0.06 \times 15\,194$$
$$911.64$$

$$2005 \rightarrow 15\,194 - 912$$
$$14\,282$$

$$2006 \text{ Dec } \rightarrow 4\% \text{ of } 14\,282$$
$$0.04 \times 14\,282$$
$$571.28$$

$$2006 \rightarrow 14\,282 - 571$$
$$13\,711$$

15. a) $150 \text{ cm} = 90\%$ of n

90% of $n = 150 \text{ cm}$

$$\frac{\cancel{0.9} \times n}{\cancel{0.9}} = \frac{150}{\cancel{0.9}}$$

$$n = 166.7 \text{ cm}$$

b) 98% of $n = 176$

$$\frac{\cancel{0.98} \times n}{\cancel{0.98}} = \frac{176}{\cancel{0.98}}$$

$$n = 179.6$$

16. 175

$$90\% \text{ of } n = 175$$

$$\frac{0.90 \times n}{0.9} = \frac{175}{0.9}$$

$$n = 194\text{cm}$$

17. No, this is not a correct statement.

Original price = \$20

$$120\% = \$24 \times$$

Attachments

Extra Practice 1 Relating Fraction, decimal and percent.pdf