Warm Up Grade 8

Feb. 21, 2020 Finding the Percent Increase or Percent Decrease

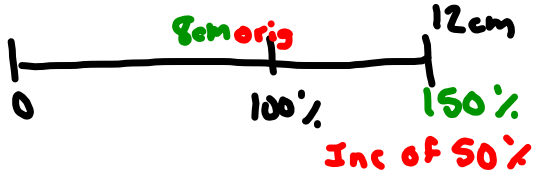
* remember the original is always the first one**

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

orig

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

Diff = Big − Small
= 12cm − 8cm
= 4cm



Inc of 50%

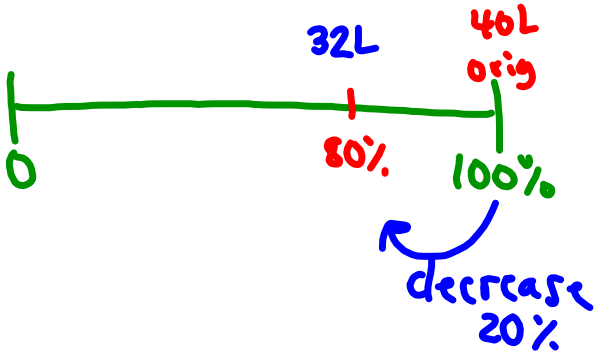
$$\%\text{ inc} = \frac{\text{Diff}}{\text{orig}} \times 100$$
$$= \frac{4}{8} \times 100$$
$$= 0.50 \times 100$$
$$= 50\ \%$$

orig

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

Diff = Big − Small
= 40L − 32L
= 8L

$$\%\text{ dec} = \frac{\text{Diff}}{\text{orig}} \times 100$$
$$= \frac{8\text{L}}{40\text{L}} \times 100$$
$$= 0.2 \times 100$$
$$= 20\ \%\ \text{decrease}$$



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)

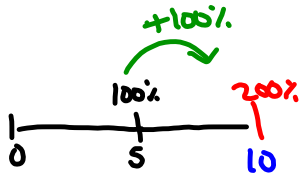
****

5. a) Amt of Inc = 10 − 5
= 5

$$\%\,Inc = \frac{Amt\ of\ Inc}{Orig\ Amt} \times 100\%$$

$$= \frac{5}{5} \times 100\%$$

$$= 100\%$$



b) Amt of Inc = 12 − 8
= 4

$$\%\,Inc = \frac{Amt\ of\ Inc}{Orig\ Amt} \times 100\%$$

$$= \frac{4}{8} \times 100\%$$

$$= 0.5 \times 100\%$$

$$= 50\%$$

6. Amt of Dec = 15 − 12
= 3

$$\%\ Dec = \frac{Amt\ of\ Dec}{Orig\ Amt} \times 100\%$$

$$= \frac{3}{15} \times 100\%$$

$$= 0.2 \times 100\%$$

$$= 20\%$$

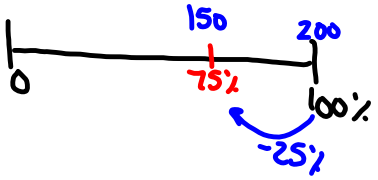
b) Amt of Dec = 200 − 150
= 50

$$Percent\ Dec = \frac{Amt\ of\ Dec}{Orig\ Amt} \times 100\%$$

$$= \frac{50}{200} \times 100\%$$

$$= 0.25 \times 100\%$$

$$= 25\%$$



8. a) Amt of Inc = 344 000 − 320 000
= 24 000

$$\%\text{ Inc} = \frac{\text{Amt of Inc}}{\text{Orig Amt}} \times 100\%$$

$$= \frac{24\,000}{320\,000} \times 100\%$$

$$= 0.075 \times 100\%$$

$$= 7.5\%$$

b) Amt of Inc = 99 284 − 41 715
= 57 569

$$\%\text{ Inc} = \frac{\text{Amt of Inc}}{\text{Orig Amt}} \times 100\%$$

$$= \frac{57\,569}{41\,715} \times 100\%$$

$$= 1.38 \times 100\%$$

$$= 138\%$$

7. a) 15% is 125

15% of n = 125

$0.15n = 125$

$\frac{0.15n}{0.15} = \frac{125}{0.15}$

$n = 833.3$

b) 9% of ___ is 45 ÷9

÷9

1% of ___ is 5

100% of ___ is 5 x 100

500

number is 500

$0.09n = 45$

$\frac{0.09n}{0.09} = \frac{45}{0.09}$

$n = 500$

c) 0.8% of ___ is 12

↓change to dec

$0.008 \times n = 12$

$\frac{0.008n}{0.008} = \frac{12}{0.008}$

$n = 1500$

9a) 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) 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 → 12% less miners

12% of miners in 1986
12% of 193 000
0.12 × 193 000
23160 → fewer miners

So in 2001
193 000 − 23 160
169 840 miners in 2001

Class / Homework

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#10, #11, #12, #13, #14, #16, #17

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

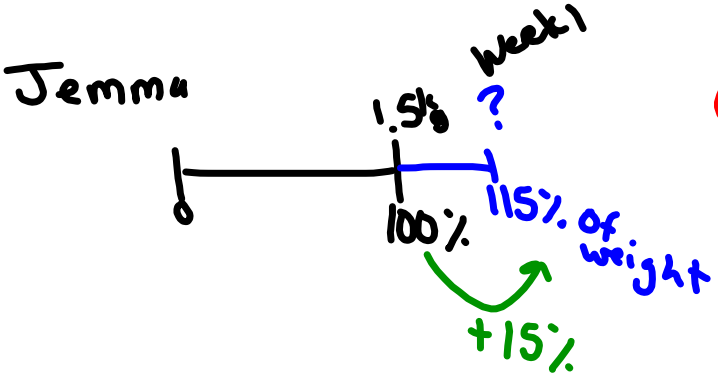
Girl: 95% of adult height is 168 cm at age 13, find adult height?

Extra Practice 1: # 1 to #7

Use your notes

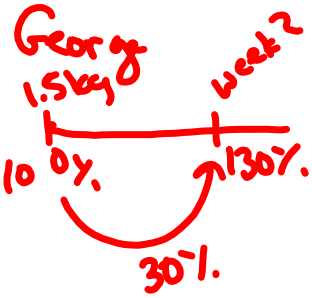
4) Jemma Start 1.5 kg ? 15%.

George 1.5 kg



Week 1 = 115% of orig
= 1.15 x 1.5kg
= 1.725kg

Week 2 = 115% of Week 1
= 1.15 x 1.725kg
= 1.98375 kg
≈ 1.98 kg



130% of Birth
1.3 X 1.5 kg
= 1.95 kg

13) Year 1990 693 000 → original ⇒ 100%.

a) Year 1990 to 2000 have 24% increase

Now Pop is

124% of orig Pop

= 1.24 X 693 000

= 859 320

b) 11% increase of year 2000

111% of pop of year 2000

= 1.11 X 859 320

people at end of 2005 = 953 845

c) 1990 → 2005

693000 → 953845

$$\text{Diff} = \begin{array}{r} 953\,845 \\ -\ 693\,000 \\ \hline 260\,845 \end{array}$$

$$\%\ \text{inc} = \frac{\text{Diff}}{\text{orig}} \times 100$$

$$= \frac{260\,845}{693\,000} \times 100$$

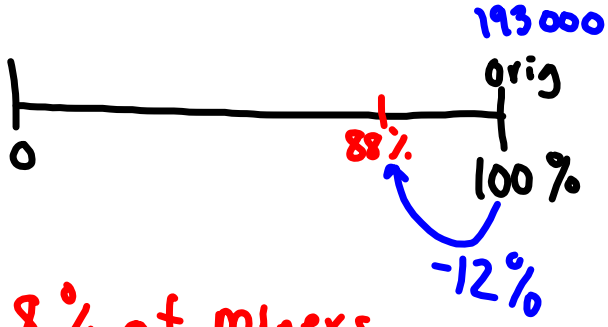
$$= 0.376 \times 100$$

$$\approx 37.6\%\ \text{increase}$$

b) 1986 there was 193 000 miners.

By 2001 there was a decrease of 12 %.

% dec = 12 %



88 % of miners

0.88 X 193 000

= 169 840

10) → down 12% of miners (went)

$0.12 \times 193\,000$

$= 23\,160$ (went)

Left over miners $= 193000 - 23\,160$

$= 169\,840$

of 55m → 12m

1) Diff = Big - Small
= 55 - 12

% dec = $\frac{\text{Diff}}{\text{orig}} \times 100$

10. 2001 → 12% less miners

12% of miners in 1986
12% of 193 000
0.12 × 193 000
23160 → fewer miners

So in 2001
193 000 − 23 160
169 840 miners in 2001

12. Jemma

Week 1 Increase: 15% of 1.5
0.15 × 1.5
0.225

Mass after week 1 → 1.5 + 0.225
1.725

Week 2 Increase: 15% of 1.725
0.15 × 1.725
0.25875

Jemma's Mass-Week 2: 1.725 + 0.25875
1.98375 kg

George 30% increase in 2 weeks:
30% of 1.5
= 0.3 × 1.5
= 0.45

Total Mass: 1.5 + 0.45
1.95 kg

11. Amt of Dec $55 - 12$
43

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

12. Jemma

Week 1 Increase: 15% of 1.5
0.15×1.5
0.225

Mass after week 1 $\Rightarrow 1.5 + 0.225$
1.725

Week 2 Increase: 15% of 1.725
0.15×1.725
0.25875

Jemma's Mass-Week 2: $1.725 + 0.25875$
1.98375 kg

George
30% increase
in 2 weeks

30% of 1.5
$= 0.3 \times 1.5$
$= 0.45$

Total Mass $1.5 + 0.45$
1.95 kg

(b)

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

0.24 x 693 000
166 320

Pop. in 2000: 693 000 + 166 320
859 320

b) 11% Increase in 2005

11% of 859 320
0.11 x 859 320
94 525.2

Pop in 2005 →

859 320 + 94 525
953 845

c) Amt of Inc = 953 845 − 693 000
= 260 845

$$\%\ \text{Inc} = \frac{\text{Amt of Inc}}{\text{Orig Amt}} \times 100\%$$

$$= \frac{260\,845}{693\,000} \times 100\%$$

$$= 0.376 \times 100\%$$

$$= 37.6\%$$

d)

- 15. a) 150cm = 90% of adult height

90% of n = 150cm

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

$n = 166.\overline{7}$ cm

b) 98% of n = 176

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

$n = 179.6$

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

0.24 × 693 000
166 320

Pop. in 2000: 693 000 + 166 320
859 320

b) 11% Increase in 2005

11% of 859 320
0.11 × 859 320
94 525.2

Pop in 2005 →

859 320 + 94 525
953 845

c) Amt of Inc = 953 845 − 693 000
= 260 845

$$\%\ \text{Inc} = \frac{\text{Amt of Inc}}{\text{Orig Amt}} \times 100\%$$

$$= \frac{260\,845}{693\,000} \times 100\%$$

$$= 0.376 \times 100\%$$

$$= 37.6\%$$

d)

14. 2005 Dec 6% of 15 194

0.06 x 15 194

911.64

2005 → 15 194 − 912

14 282

2006 Dec → 4% of 14 282

0.04 x 14 282

571.28

2006 → 14 282 − 571

13 711

15. a) 150cm = 90% of adult height

90% of n = 150cm

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

$n = 166.\overline{7}\text{cm}$

b) 98% of n = 176

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

$n = 179.6$

16. 175

90% of $n = 175$

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

$n = 194\text{cm}$

17. no, this is not a correct statement.

Original price = $\$20$

$120\% = \$24$ x

Attachments

Extra Practice 1 Relating Fraction, decimal and percent.pdf