Percentage

#13 of Gottschalk's Gestalts

A Series Illustrating Innovative Forms
of the Organization & Exposition
of Mathematics
by Walter Gottschalk

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GG13-2

D. percentage = the notion of percent

let

• $n, m \in$ real nr

then

• n percent

= dn n%

= rd n percent

= df $\frac{n}{100} \in$ real nr

• n percent of m

= n% of m

= df $\frac{n}{100} \times m = \frac{nm}{100} \in$ real nr

note: the word percent is an abbreviation of the phrase
per centum (Latin) = per hundred;
the percent sign % is a combination of
the two zeros in 100 and the slash fraction sign /
thus $n / 100 = n\%$

☐ conversion of halves
to decimals & percentages

$\frac{0}{2} = 0 = 0\%$

$\frac{1}{2} = 0.5 = 50\%$

$\frac{2}{2} = 1 = 100\%$

☐ conversion of thirds
to decimals & percentages

$\frac{0}{3} = 0 = 0\%$

$\frac{1}{3} = 0.\dot{3} = 33\frac{1}{3}\% = 33.\dot{3}\% \approx 34\%$

$\frac{2}{3} = 0.\dot{6} = 66\frac{2}{3}\% = 66.\dot{6}\% \approx 67\%$

$\frac{3}{3} = 1 = 100\%$

☐ conversion of fourths
to decimals & percentages

$\frac{0}{4} = 0 = 0\%$

$\frac{1}{4} = 0.25 = 25\%$

$\frac{2}{4} = \frac{1}{2} = 0.5 = 50\%$

$\frac{3}{4} = 0.75 = 75\%$

$\frac{4}{4} = 1 = 100\%$

☐ conversion of fifths
to decimals & percentages

$\frac{0}{5} = 0 = 0\%$

$\frac{1}{5} = 0.2 = 20\%$

$\frac{2}{5} = 0.4 = 40\%$

$\frac{3}{5} = 0.6 = 60\%$

$\frac{4}{5} = 0.8 = 80\ \%$

$\frac{5}{5} = 1 = 100\%$

☐ conversion of sixths
to decimals & percentages

$\frac{0}{6} = 0 = 0\%$

$\frac{1}{6} = 0.1\dot{6} = 16\frac{2}{3}\% = 16.\dot{6}\% \approx 17\%$

$\frac{2}{6} = \frac{1}{3} = 0.\dot{3} = 33\frac{1}{3}\% = 33.\dot{3}\% \approx 33\%$

$\frac{3}{6} = \frac{1}{2} = 0.5 = 50\%$

$\frac{4}{6} = \frac{2}{3} = 0.\dot{6} = 66\frac{2}{3}\% = 66.\dot{6}\% \approx 67\%$

$\frac{5}{6} = 0.8\dot{3} = 83\frac{1}{3}\% = 83.\dot{3}\% \approx 83\%$

$\frac{6}{6} = 1 = 100\%$

☐ conversion of sevenths
to decimals & percentages

$$\frac{0}{7} = 0 = 0\%$$

$$\frac{1}{7} = 0.\dot{1}42857\dot{} = 14\frac{2}{7}\% = 14.\dot{2}8571\dot{4}\% \approx 14\%$$

$$\frac{2}{7} = 0.\dot{2}8571\dot{4} = 28\frac{4}{7}\% = 28.\dot{5}7142\dot{8}\% \approx 29\%$$

$$\frac{3}{7} = 0.\dot{4}2857\dot{1} = 42\frac{6}{7}\% = 42.\dot{8}5714\dot{2}\% \approx 43\%$$

$$\frac{4}{7} = 0.\dot{5}7142\dot{8} = 57\frac{1}{7}\% = 57.\dot{1}42857\dot{}\% \approx 57\%$$

$$\frac{5}{7} = 0.\dot{7}1428\dot{5} = 71\frac{3}{7}\% = 71.\dot{4}2857\dot{1}\% \approx 71\%$$

$$\frac{6}{7} = 0.\dot{8}5714\dot{2} = 85\frac{5}{7}\% = 85.\dot{7}1428\dot{5}\% \approx 86\%$$

$$\frac{7}{7} = 1 = 100\%$$

☐ conversion of eighths
to decimals & percentages

$$\frac{0}{8} = 0 = 0\%$$

$$\frac{1}{8} = 0.125 = 12.5\%$$

$$\frac{2}{8} = \frac{1}{4} = 0.25 = 25\%$$

$$\frac{3}{8} = 0.375 = 37.5\%$$

$$\frac{4}{8} = \frac{1}{2} = 0.5 = 50\%$$

$$\frac{5}{8} = 0.625 = 62.5\%$$

$$\frac{6}{8} = \frac{3}{4} = 0.75 = 75\%$$

$$\frac{7}{8} = 0.875 = 87.5\%$$

$$\frac{8}{8} = 1 = 100\%$$

☐ conversion of nineths
to decimals & percentages

$\frac{0}{9} = 0 = 0\%$

$\frac{1}{9} = 0.\dot{1} = 11\frac{1}{9}\% = 11.\dot{1}\% \approx 11\%$

$\frac{2}{9} = 0.\dot{2} = 22\frac{2}{9}\% = 22.\dot{2}\% \approx 22\%$

$\frac{3}{9} = \frac{1}{3} = 0.\dot{3} = 33\frac{1}{3}\% = 33.\dot{3}\% \approx 33\%$

$\frac{4}{9} = 0.\dot{4} = 44\frac{4}{9}\% = 44.\dot{4}\% \approx 44\%$

$\frac{5}{9} = 0.\dot{5} = 55\frac{5}{9}\% = 55.\dot{5}\% \approx 56\%$

$\frac{6}{9} = \frac{2}{3} = 0.\dot{6} = 66\frac{2}{3}\% = 66.\dot{6}\% \approx 67\%$

$\frac{7}{9} = 0.\dot{7} = 77\frac{7}{9}\% = 77.\dot{7}\% \approx 78\%$

$\frac{8}{9} = 0.\dot{8} = 88\frac{8}{9}\% = 88.\dot{8}\% \approx 89\%$

$\frac{9}{9} = 1 = 100\%$

☐ conversion of tenths
to decimals & percentages

$$\frac{0}{10} = 0 = 0\%$$

$$\frac{1}{10} = 0.1 = 10\%$$

$$\frac{2}{10} = \frac{1}{5} = 0.2 = 20\%$$

$$\frac{3}{10} = 0.3 = 30\%$$

$$\frac{4}{10} = \frac{2}{5} = 0.4 = 40\%$$

$$\frac{5}{10} = \frac{1}{2} = 0.5 = 50\%$$

$$\frac{6}{10} = \frac{3}{5} = 0.6 = 60\%$$

$$\frac{7}{10} = 0.7 = 70\%$$

$$\frac{8}{10} = \frac{4}{5} = 0.8 = 80\%$$

$$\frac{9}{10} = 0.9 = 90\%$$

$$\frac{10}{10} = 1 = 100\%$$

☐ conversion of unit fractions
to decimals & percentages

$$\frac{1}{1} = 1 = 100\%$$

$$\frac{1}{2} = 0.5 = 50\%$$

$$\frac{1}{3} = 0.\dot{3} = 33\tfrac{1}{3}\% = 33.\dot{3}\% \approx 33\%$$

$$\frac{1}{4} = 0.25 = 25\%$$

$$\frac{1}{5} = 0.2 = 20\%$$

$$\frac{1}{6} = 0.1\dot{6} = 16\frac{2}{3}\% = 16.\dot{6}\% \approx 17\%$$

$$\frac{1}{7} = 0.\dot{1}42857 = 14\frac{2}{7}\% = 14.\dot{2}8571\dot{4}\% \approx 14\%$$

$$\frac{1}{8} = 0.125 = 12\frac{1}{2}\% = 12.5\%$$

$$\frac{1}{9} = 0.\dot{1} = 11\frac{1}{9}\% = 11.\dot{1}\% \approx 11\%$$

$$\frac{1}{10} = 0.1 = 10\%$$

$$\frac{1}{11} = 0.\dot{0}\dot{9} = 9\frac{1}{11}\% = 9.\dot{0}\dot{9}\% \approx 9.1\%$$

$$\frac{1}{12} = 0.08\dot{3} = 8\frac{1}{3}\% = 8.\dot{3}\% \approx 8.3\%$$

$$\frac{1}{13} = 0.\dot{0}76923 = 7\frac{9}{13}\% = 7.\dot{6}92307\% \approx 7.7\%$$

$$\frac{1}{14} = 0.0\dot{7}1428\dot{5} = 7\frac{1}{7}\% = 7.\dot{1}4285\dot{7}\% \approx 7.1\%$$

$$\frac{1}{15} = 0.0\dot{6} = 6\frac{2}{3}\% = 6.\dot{6}\% \approx 6.7\%$$

$$\frac{1}{20} = 0.05 = 5\%$$

$$\frac{1}{25} = 0.04 = 4\%$$

$$\frac{1}{30} = 0.0\dot{3} = 3\tfrac{1}{3}\% = 3.\dot{3}\% \approx 3\%$$

$$\frac{1}{40} = 0.025 = 2\tfrac{1}{2}\% = 2.5\%$$

$$\frac{1}{50} = 0.02 = 2\%$$

$$\frac{1}{60} = 0.01\dot{6} = 1\frac{2}{3}\% = 1.\dot{6}\% \approx 1.7\%$$

$$\frac{1}{70} = 0.0\dot{1}42857\dot{1} = 1\frac{3}{7}\% = 1.\dot{4}2857\dot{1}\% \approx 1.4\%$$

$$\frac{1}{80} = 0.0125 = 1\frac{1}{4}\% = 1.25\%$$

$$\frac{1}{90} = 0.0\dot{1} = 1\frac{1}{9}\% = 1.\dot{1}\% \approx 1.1\%$$

$$\frac{1}{100} = 0.01 = 1\%$$

$$\frac{1}{200} = 0.005 = \frac{1}{2}\% = 0.5\%$$

$$\frac{1}{400} = 0.0025 = \frac{1}{4}\% = 0.25\%$$

$$\frac{1}{500} = 0.002 = \frac{1}{5}\% = 0.2\%$$

$$\frac{1}{800} = 0.00125 = \frac{1}{8}\% = 0.125\%$$

$$\frac{1}{1000} = 0.001 = \frac{1}{10}\% = 0.1\%$$

$$10^0 = \frac{1}{1} = 1 = 100\%$$

$$10^{-1} = \frac{1}{10^1} = \frac{1}{10} = 0.1 = 10\%$$

$$10^{-2} = \frac{1}{10^2} = \frac{1}{100} = 0.01 = 1\%$$

$$10^{-3} = \frac{1}{10^3} = \frac{1}{1000} = 0.001 = \frac{1}{10}\% = 0.1\%$$

$$10^{-4} = \frac{1}{10^4} = \frac{1}{10,000} = 0.0001 = \frac{1}{100}\% = 0.01\%$$

$$10^{-5} = \frac{1}{10^5} = \frac{1}{100,000} = 0.00001 = \frac{1}{1000}\% = 0.001\%$$

etc

☐ conversion of integers & integer - halves to percentages

0 = 0%

0.5 = 50%

1 = 100%

1.5 = 150%

2 = 200%

2.5 = 250%

3 = 300%

3.5 = 350%

4 = 400%

4.5 = 450%

5 = 500%

5.5 = 550%

etc