0-6: The Percent Proportion

Ex #1: Please complete the table, by either filling in the missing equivalent fraction, or the missing equivalent percentage. Always be sure to simplify your fractions.

The first row is a given sample. *reminder: percent means "out of 100"*

Fraction	Percentage
$\dfrac{1}{2}$	50%
$\dfrac{20}{100} = \dfrac{2}{10} = \dfrac{1}{5}$	20%
$\dfrac{41}{100}$	41%
$\dfrac{42}{100} \dfrac{\div 2}{\div 2} = \dfrac{21}{50}$	42%
$\dfrac{27}{50} \cdot \dfrac{2}{2} = \dfrac{54}{100}$	54%
$\dfrac{10}{100} = \dfrac{1}{10}$	10%
1	100% (1 is a whole)
$\dfrac{1}{100}$	1%
$\dfrac{1}{4} \cdot \dfrac{25}{25} = \dfrac{25}{100}$	25%
$\dfrac{350}{100} = \dfrac{35}{10}$ or $10\overline{)35} = \boxed{3.5}$	350%
$\dfrac{3}{5} \cdot \dfrac{20}{20} = \dfrac{60}{100}$	60%
$\dfrac{84}{100} \div$ Common factor of 4 $= \dfrac{21}{25}$	84%
$\dfrac{2}{40} \dfrac{1}{20} \cdot \dfrac{5}{5} = \dfrac{5}{100}$	5%
(also done in video) $\dfrac{3}{8}$ $8\overline{)100.0}$	$\dfrac{3}{8} \cdot \dfrac{12.5}{12.5} = \dfrac{37.5}{100} = 37.5\%$

$\dfrac{3}{8} = \dfrac{x}{100}$

↳ times what?

$8\overline{)100.0}$
$\underline{-8}\downarrow$
20
$\underline{-16}\downarrow$
40
$\underline{-40}$

$\begin{array}{r} 12.5 \\ \times \quad 3 \\ \hline 37.5 \end{array}$

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To get 10% of a number, move the decimal once. (same as dividing the number by 10, thus $\frac{1}{10}$ of it)

Ex #2: Please evaluate the following.

(a) What is 20% of 40?

$10\% = 4$

$\boxed{20\% = 8}$

(b) What is 15% of 40?

$10\% = 4$

$+ \ 5\% = 2$

$\boxed{15\% = 6}$

(c) 18 is what percent of 60?

$\dfrac{18}{60} \div \dfrac{6}{6} = \dfrac{3}{10} \cdot \dfrac{10}{10} = \dfrac{30}{100}$

$\boxed{30\%}$

(d) 40% of what number is 42?

40% of something is 42.

÷2 thus 20% of something is 21.

·5 thus 100% of something is 105. $\boxed{105}$

Ex #3: My neighbor claims to be able to make 90% of her free throws in basketball. So if I challenge her to take 30 shots, by her non-arrogant claim, how many should she be able to hit?

If 100% of 30 shots is 30
and 10% of 30 shots is 3

Then
$\begin{array}{r} 100\% \\ - \ 10\% \\ \hline 90\% \end{array}$ ↔ $\begin{array}{r} 30 \\ - \ 3 \\ \hline 27 \text{ shots} \end{array}$

$90\% = 27 \text{ shots}$

By subtracting 10%, we see that $90\% = \boxed{27 \text{ shots.}}$

Good luck with that, my humble neighbor!

Ex #4: Suppose that when your friend Chris sees his test score, he panics. He says, "I really needed at least an 80% of this test, but I only got a 68 out of 80!" What would your response be to Chris?

(Remember, you're his friend. So you must help him calculate his percentage, then either confirm or refute his initial reaction, without judgement.)

$\dfrac{68}{80} \div \dfrac{4}{4} = \dfrac{17}{20} \cdot \dfrac{5}{5} = \dfrac{85}{100} = 85\%$

or,
$\begin{array}{r} 10\% = 8 \text{ points} \\ + \ 5\% = 4 \text{ points} \\ \hline 15\% = 12 \text{ points} \end{array}$

(Since he lost 12 points off of 80, that's 15% off. Thus, he got an 85%.)

Chris, first of all, calm down. Seems like you panicked so much that you meant to say "on this test" not "of this test." You're fine; you got an 85%. I would invite you to think about what you're afraid of, and reflect on if that fear is helping you create your best life.

Ex #5: If a parent is 50 years old, and a child is 20 years old, the parent is what percent of the child's age?

what is $\dfrac{50}{20}$? $\dfrac{50}{20} \cdot \dfrac{5}{5} = \dfrac{250}{100} = \boxed{250\%}$

or, 100% of 20 = 20
200% of 20 = 40
50% of 20 = 10

$\begin{array}{r} 200\% \\ + \ 50\% \\ \hline 250\% \end{array}$ ↔ $\begin{array}{r} 40 \text{ years} \\ + \ 10 \text{ years} \\ \hline = 50 \text{ years} \end{array}$

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