SOLUTIONS

MAP102 Placement Exam Prep – Prealgebra

This set of questions will help you to prepare for the pre-algebra fundamentals not included on the lecture videos. Try them in the next few days then I will provide detailed explanations.

Remember you will be expected to solve these without a calculator!

1. If $2^x = 32$, then $x =$

$32 = 4 \cdot 8$

$= 2 \cdot 2 \cdot 2 \cdot 4$

$32 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \rightarrow 32 = 2^5$ $\quad 2^x = 2^5$ means $\boxed{x = 5}$

2. $6\frac{1}{4} - 2\frac{1}{2} =$

get common denominator for addition/subtraction

$\frac{1}{4}$ vs. $\frac{1}{2} \cdot \frac{2}{2}$ (multiply across)

$\frac{1}{4} < \frac{2}{4}$ need to borrow to subtract

$= 6\frac{1}{4} - 2\frac{2}{4}$

$= 5\frac{5}{4}$

$-2\frac{2}{4}$

$\boxed{3\frac{3}{4}}$

$6\frac{1}{4} = 6 + \frac{1}{4}$

$= 5 + 1 + \frac{1}{4}$ get common denominator

$= 5 + \frac{4}{4} + \frac{1}{4}$

$= 5\frac{5}{4}$

3. $\left(2\frac{1}{3}\right)\left(3\frac{1}{2}\right) =$ re-write multiplication of mixed numbers as multiplication of improper fractions: $2\frac{1}{3} = \frac{7}{3}$, $3\frac{1}{2} = \frac{7}{2}$

$= \frac{7}{3} \cdot \frac{7}{2} = \boxed{\frac{49}{6} \text{ or } 8\frac{1}{6}}$

no common denom. needed – multiply across

$8\frac{1}{6}$

$6\overline{)49}$

-48

1

4. $4+3*6=$

do multiplication 1st! (order of operations)

$4+3*6$

$= 4+18$

$= \boxed{22}$

a fraction line is a symbol for division

5. $\dfrac{\left(\frac{4}{3}\right)}{\left(\frac{3}{4}\right)} = \frac{4}{3} \div \frac{3}{4}$

use Keep Change Flip to change division to multiplication

$= \frac{4}{3} \cdot \frac{4}{3}$ (Keep, change, Flip (reciprocal)) $\overset{\text{mult. across}}{=} \boxed{\frac{16}{9}}$

6. 35 is what percent of 50?

Format of Proportion

$\frac{\%}{100} = \frac{is}{of} \longrightarrow \frac{x}{100} = \frac{35}{50}$ (x: unknown)

↑ cross multiply when = is present

$\frac{50x}{50} = \frac{35 \cdot 100}{50}$

$x = 35.2$

$= 70\%$ * don't forget units

7. As a decimal, $\frac{1}{9} =$

↑ division

$0.111\ldots$

$9\overline{)1.000}$

9

10

9

10

9

1

write a repeating decimal by representing the repeated value(s) ONCE and put a bar over the pattern

$0.111\ldots = 0.\overline{1}$

ex. $.545454\ldots = .\overline{54}$ ↖ bar over both #'s

ex. $.91777\ldots = .91\overline{7}$ ↖ bar only over what repeats

8. A car travels due east at a constant speed of 30 miles per hour. How long will it take the car to go 75 miles?

distance traveled ↑ rate ↑ time ↑

Use the Distance Formula

distance = rate * time

$d = rt$

$30 = r$

want t

$d = 75$

$d = rt$

$75 = 30t$

$t = \frac{75}{30}$ hours

Convert $\frac{75}{30}$ into a useful #

$\frac{75}{30} = \frac{3 \cdot 5 \cdot 5}{3 \cdot 2 \cdot 5} = \frac{5}{2}$

$2 \overline{)5}$ (2 goes 2 times, remainder 1, $\frac{1}{2}$)

$= 2\frac{1}{2}$ hrs

9. $\sqrt{12} + \sqrt{27} =$ Simplify radicals to be same

$= \sqrt{4 \cdot 3} + \sqrt{9 \cdot 3}$

$= \sqrt{4}\sqrt{3} + \sqrt{9}\sqrt{3}$

$= 2\sqrt{3} + 3\sqrt{3}$ ← how they are like terms

$= 5\sqrt{3}$

10. On January 1, 2000, one share of Acme Inc was worth \$80. Today, one share of Acme Inc is worth 185% of what it was worth on January 1,2000. How much is one share of Acme Inc worth today?

$$\frac{\text{ORIG \%} = 100\%}{\text{CORRESPONDING VALUE}} = \frac{\text{CURRENT \%}}{\text{CORRESPONDING VALUE}}$$

$$\frac{100}{80} = \frac{185}{x}$$ cross multiply

$$\frac{100x}{100} = \frac{185 \cdot 80}{100}$$

$$x = \frac{185 \cdot 8}{10}$$

$$= \frac{1480}{10} = \$148$$

$185 \times 8 = 1480$