Credit for Prior Learning: Initial Assessment QL 122/GEQL 130
Sample Questions SOLUTIONS

1. Percent decrease is calculated by comparing a decrease to an original value, and then converting this to a percent. In this case, the decrease in the number of ponds supporting trout would be 9 (19 ponds -10 ponds) and the original number of ponds supporting trout would be 19…

$$\frac{9 \text{ pond decrease}}{19 \text{ ponds originally}} = 9 \div 19 = 0.4737 = \frac{0.4737}{1} = \frac{0.4737 \times 100}{1 \times 100} = \frac{47.37}{100} = 47.37\%$$

There would be a 47.37% decrease in the number of trout supporting ponds in Washburn if there is even this small temperature increase.

Or solved via proportion…

$$\frac{9}{19} = \frac{x}{100}$$

$$(9)(100) = (19)(x)$$

$$900 = 19x$$

$$\frac{900}{19} = \frac{19x}{19}$$

$$47.3 = x$$

There would be a 47% decrease in the number of trout supporting ponds in Washburn if there is a moderate temperature increase.

2. Set up and solve a proportion…

$$\frac{2 \text{ counties with average temperature increases of 4.5 degrees or more}}{7 \text{ counties with an average temperature increase of less than 4.5 degrees}} = \frac{16}{x}$$

$$(2)(x) = (16)(7)$$

$$2x = 112$$

$$\frac{2x}{2} = \frac{112}{2}$$

$$x = 56$$

There are 56 Wisconsin counties that saw average temperature increases of less than 4.5 degrees from 1950 to 2010.

3. Solved using dimensional analysis…

$$\left(\frac{3.6 \text{ acres}}{1}\right)\left(\frac{97.5 \text{ brook trout}}{1 \text{ acre}}\right) = 351$$

About 351 brook trout would be found in this pond.

Solved using a proportion…

$$\frac{97.5 \text{ brook trout}}{1 \text{ acre}} = \frac{x \text{ brook trout}}{3.6 \text{ acres}}$$

$$(97.5)(3.6) = (1)(x)$$

$$351 = 1x$$

$$\frac{351}{1} = \frac{1x}{1}$$

$$351 = x$$

Priceless pond supports 351 brook trout.

4. Solved using a direct translation…

39% of the brook trout population in Tenny Spring Creek is infected…

$$0.39(\text{brook trout population}) = (\text{number of infected trout})$$

$$0.39(843) = 328.77$$

So, about 329 brook trout are infected with gill lice in this particular creek.

Solved using a proportion…

$$\frac{39 \text{ infected fish}}{100 \text{ total fish}} = \frac{x \text{ infected fish}}{843 \text{ total fish}}$$

$$(39)(843) = (100)(x)$$

$$32877 = 100x$$

$$\frac{32877}{100} = \frac{100x}{100}$$

$$328.77 = x$$

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5. Part to whole relationship, converting to a percent…

$$\frac{\text{50000 gallons produced in WI}}{\text{1900000 gallons produced in the nation}} = 50000 \div 1900000 = 0.026 = \frac{0.026}{1}$$

$$= \frac{0.026 \times 100}{1 \times 100} = \frac{2.6}{100} = 2.6\%$$

In 2012, Wisconsin produced only 2.6% of our nation's maple syrup.

Solve as proportion…

$$\frac{\text{50000 gallons produced in WI}}{\text{1900000 gallons produced in the nation}} = \frac{x}{100}$$

$$(50000)(100) = (1900000)(x)$$

$$5000000 = 1900000x$$

$$\frac{5000000}{1900000} = \frac{1900000x}{1900000}$$

$$2.63 = x$$

2.6% of our nation's maple syrup crop was produced in Wisconsin in 2012.

6.

a. This is a part to whole relationship.

$$\frac{2018\ Wisconsin\ maple\ syrup\ production}{2018\ Midwest\ maple\ syrup\ production} = \frac{225}{471}$$

b. This, too, is a part to whole relationship that then needs to be converted to a percent.

$$\frac{2017\ maple\ syrup\ production\ from\ eastern\ states}{2017\ U.S.\ maple\ syrup\ production} = \frac{3855}{4271} = 3855 \div 4271$$
$$= 0.9025 = 90.25\%$$

7. We have to convert the percent given, 68%, to a fraction. Since 68% is a comparison of 68 to 100, the fraction is $\frac{68}{100} = \frac{34}{50} = \frac{17}{25}$

8. $\left(\frac{2}{3}-1\frac{2}{5}\right)\div\left(2\frac{1}{2}+\frac{8}{15}\right)$

$$=\left(\frac{2}{3}-\frac{7}{5}\right)\div\left(\frac{5}{2}+\frac{8}{15}\right)$$

$$=\left(\frac{2\times5}{3\times5}-\frac{7\times3}{5\times3}\right)\div\left(\frac{5\times15}{2\times15}+\frac{8\times2}{15\times2}\right)$$

$$=\left(\frac{10}{15}-\frac{21}{15}\right)\div\left(\frac{75}{30}+\frac{16}{30}\right)$$

$$=\left(-\frac{11}{15}\right)\div\left(\frac{91}{30}\right)$$

$$=\left(-\frac{11}{15}\right)\times\left(\frac{30}{91}\right)$$

$$=-\frac{330}{1365}$$

$$=-\frac{22}{91}$$

9. $\frac{32\div(5-3)^3+8}{10-8\div4\cdot2}$

$$=\frac{32\div(2)^3+8}{10-8\div4\cdot2}$$

$$=\frac{32\div8+8}{10-8\div4\cdot2}$$

$$=\frac{4+8}{10-8\div4\cdot2}$$

$$=\frac{12}{10-8\div4\cdot2}$$

$$=\frac{12}{10-2\cdot2}$$

$$=\frac{12}{10-4}$$

$$=\frac{12}{6}$$

$$=2$$

10. $\frac{6-3x}{x+2} = \frac{5}{2}$

$$2(6-3x) = 5(x+2)$$

$$12 - 6x = 5x + 10$$

$$12 - 6x + 6x = 5x + 10 + 6x$$

$$12 = 11x + 10$$

$$12 - 10 = 11x + 10 - 10$$

$$2 = 11x$$

$$\frac{2}{11} = \frac{11x}{11}$$

$$\frac{2}{11} = x$$

11. $R = \frac{N}{T} \cdot 100$

$$N = 643$$

$$T = 657$$

$$R = \frac{643}{657} \cdot 100$$

$$R = 0.979 \cdot 100$$

$$R = 97.9$$

The retention percent is 97.9.

12. $R = \frac{N}{T} \cdot 100$

$$(T)(R) = (T)\left(\frac{N}{T} \cdot 100\right)$$

$$TR = 100N$$

$$\frac{TR}{R} = \frac{100N}{R}$$

$$T = \frac{100N}{R}$$

13. $T = L - DL - S$

$$L = \$35{,}000$$

$$D = 0.335$$

$$S = \$2000$$

$$T = 35000 - (0.335)(35000) - 2000$$

$$T = 35000 - 11725 - 2000$$

$$T = 23725 - 2000$$

$$T = 21275$$

The true tuition cost for a student is $21,275.

14. $T = L - DL - S$

$$T + S = L - DL - S + S$$

$$T + S = L - DL$$

$$T + S - T = L - DL - T$$

$$S = L - DL - T$$

or

$$T - L = L - DL - S - L$$

$$T - L = -DL - S$$

$$T - L + DL = -DL - S + DL$$

$$T - L + DL = -S$$

$$\frac{T - L + DL}{-1} = \frac{-S}{-1}$$

$$\frac{T - L + DL}{-1} = S$$

or

$$-T + L - DL = S$$

15. As a direct translation…

$$0.126(\text{Total elementary and secondary enrollment}) = \text{Private school enrollment}$$

$$0.126T = P$$

$$P = 125372$$

Substitute…

$$0.126T = 125372$$

Solve…

$$\frac{0.126T}{0.126} = \frac{125372}{0.126}$$

$$T = 995{,}016$$

So, the total enrollment for elementary and secondary schools was 995,016.

16. As a direct translation…

$$\text{Number of Elementary Teachers} = 2(\text{Number of Secondary Teachers}) + 3462$$

$$E = 2S + 3462$$

$$E = 40302$$

Substitute…

$$40302 = 2S + 3462$$

Solve…

$$40302 - 3462 = 2S + 3462 - 3462$$

$$36840 = 2S$$

$$\frac{36840}{2} = \frac{2S}{2}$$

$$18420 = S$$

There were 18,420 teachers who taught at the secondary level.

17. As a direct translation…

$$21288 - 320(\text{Number of Passing Years}) < 13500$$

$$21288 - 320Y < 13500$$

Solve…

$$21288 - 320Y - 21288 < 13500 - 21288$$

$$-320Y < -7788$$

$$\frac{-320Y}{-320} > \frac{-7788}{-320}$$

$$Y > 24.3375$$

$$Y \geq 25$$

Remember, when an inequality is divided by a negative number, the inequality changes direction.

So, in 25 or more years, the number of home schooled students will be under 13,500.

18. As a direct translation…

$$\text{Whitewater Enrollment} = 9396 + 201(\text{Number of Passing Years})$$

$$\text{Oshkosh Enrollment} = 10145 + 109(\text{Number of Passing Years})$$

$$\text{Whitewater Enrollment} = \text{Oshkosh Enrollment}$$

Substitute…

$$9396 + 201Y = 10145 + 109Y$$

Solve…

$$9396 + 201Y - 109Y = 10145 + 109Y - 109Y$$

$$9396 + 92Y = 10145$$

$$9396 + 92Y - 9396 = 10145 - 9396$$

$$92Y = 749$$

$$\frac{92Y}{92} = \frac{749}{92}$$

$$Y = 8.14$$

So, if this trend continues, enrollment will be the same at both universities in just over 8 years.

19. As a translation where $E = \text{UW Milwaukee Enrollment}$ and $N = \text{UW Madison Enrollment}$...

$$E = N - 4930$$

$$E + N = 55408$$

Substitute…

$$N - 4930 + N = 55408$$

$$2N - 4930 = 55408$$

$$2N - 4930 + 4930 = 55408 + 4930$$

$$2N = 60338$$

$$\frac{2N}{2} = \frac{60338}{2}$$

$$N = 30169$$

So, UW Madison's enrollment is 30,169 students.

Substitute…

$$E = 30169 - 4930$$

$$E = 25239$$

So, UW Milwaukee's enrollment is 25,239 students.