Practice: Distributive property,

November 3, 2021

1 Distributive Property

$$\begin{aligned}(a+b)^2 &= (a+b)\times(a+b)\\ &= a^2+ba+ab+b^2\\ &= a^2+2ab+b^2\end{aligned} \tag{1}$$

Q 1. $(a-b)^2 =$

Q 2. $(a-b)(a+b) =$

Q 3. $(x^2+1)(y-2) =$

Q 4. $(x+3)^2 =$

Q 5. $(a+b)^3 =$

Q 6. $(a-b)^3 =$

Q 7. $(a+b)(a^2-ab+b^2) =$

Q 8. $(a-b)(a^2+ab+b^2) =$

2 Factoring

Q 1. Prove divisibility rules for 3, 9; 4, 8; 11

Q 2. Find prime factorization of 360 and 1,056

Q 3. Simplify $\frac{120}{165}$; $\frac{100}{243}$

Q 4. Simplify $\frac{48x^3y^2z}{84xy^2z^3}$

Q 5. Simplify $\frac{5{,}400{,}000{,}000{,}000{,}000{,}000}{711{,}000{,}000{,}000{,}000{,}000{,}000{,}000}$

Q 6. Factor $6y^2 - 3y + 3x$

Q 7. Factor $-10t - 30b^2 + 10$

Q 8. Factor $6(y + 2) + 6 - 12x$

Q 9. Factor $\frac{2}{3}x^2 + 3x - \frac{1}{6}y$

Q 10. Find the GCF and write the factorization

$$12x^2y^4 + 16xy^3 - 20x^3y^2 =$$

$$40a^5x + 80z^5y - 120a^5z =$$

$$18x^2y + 25z^3 + 49z^2 =$$

3 Solve for Linear Equations

Q 1. $6 = 2 - 7y$

Q 2. $6 - 5a = 1$

Q 3. $-3 = 7p - 5$

Q 4. $-1 - 4s = 8$

Q 5. $2 = 3 - 2t$

Q 6.

$$9 = \frac{5 - t}{-5}$$

Q 7. $2p - 6 = 8 + 5(p + 9)$

Q 8. $7(x + 6) + 7x = 9$

Q 9. $8(x + 4) - 4 = 4x - 1$

Q 10. $3a - 3(7 + 5a) = -9(2 + a)$

Q 11. $5(2x-1) = 4(3x-2)$

Q 12. $4(x+5) = 3(x-2) - 2(x+2)$

Q 13. $6x - [2x + 3(x+1)] = x + 20$

Q 14.

$$7 = \frac{w-(-7)}{5}$$

Q 15. $1 = 6(1-p)$

Q 16. $\frac{1}{3}(21 - 3x) = \frac{1}{2}(8 - 4x)$

Q 17. $\frac{1}{3}m + \frac{1}{2}(2 + m) = \frac{1}{3} - \frac{1}{6}m$

Q 18. $\frac{3}{4}(p + 2) = \frac{1}{6} - \frac{1}{3}(4 - p)$

Q 19. $0.02m + 0.08(8 - m) = 1.78$

Q 20. $1 - 2.5(3 - m) = 3.5(3m - 5 + 4m)$

Q 21. Solve for x: $8x + 9 - 3x = 8 + 5x + 1$

4 Word Problems: Algebraic Reasoning

Q 1. The average daily sales at a bookstore was $(7.6k + 2.2)$ dollars over a 4-day promotion. Find the total sales during the promotion.

Q 2. The ratio of the number of red ribbons to yellow ribbons is 17 to 6. If the number of red ribbons is $2m + 5$, how many ribbons are yellow?

Q 3. During summer vacation, 36% of N children went to Europe, 24 children to Asia, and the rest of the children went to South America. How many children went to South America?

Q 4. A construction company is using a water well drilling rig to find water at a new construction site. The rig has drilled to an altitude of -60 feet after one full day of continuous use.

1. Assuming the rig drilled at a constant rate, what was the altitude of the drill after 15 hours? Draw a model to represent the altitude of the drill relative to ground level after 15 hours and after the full day. Show all of your calculation.

2. The rig has been running constantly and is currently at an altitude of -143.6 feet. Draw a model to represent the altitude of the drill relative to ground level.

3. For how long has the rig been running? Show all of your calculations.