

Cumulative Review

Name: Key

Solve each equation for x.

1. $3x + 1 = 4x - 2$

$$x = \underline{3}$$

$$\begin{array}{r} 3x+1 = 4x-2 \\ 3x+1-4x = 4x-2-4x \\ -1x+1 = -2 \\ -1x+1-1 = -2-1 \\ -1x = -3 \\ \boxed{x=3} \end{array}$$

2. $5(x-6) - 2 = 2x - 5$

$$x = \underline{9}$$

Key

$$\begin{aligned} 5(x-6) - 2 &= 2x - 5 \\ 5x - 30 - 2 &= 2x - 5 \\ 5x - 32 &= 2x - 5 \\ 5x - 32 - 2x &= 2x - 5 - 2x \\ 3x - 32 &= -5 \end{aligned}$$

Apply the distributive property before you isolate the variable.

$$3x - 32 = -5$$

$$3x - 32 + 32 = -5 + 32$$

$$3x = 27$$

$$\boxed{x=9}$$

3. $7x + 12 = 2(x + 6)$

$$x = \underline{0}$$

$$\begin{array}{r} 7x+12 = 2(x+6) \\ 7x+12 = 2x+12 \\ 7x+12-2x = 2x+12-2x \\ 5x+12 = 12 \\ 5x+12-12 = 12-12 \\ 5x = 0 \\ \boxed{x=0} \end{array}$$

4. $3(x-4) + 6 = 5(x-1) + 1$

$$x = \underline{-1}$$

$$\begin{aligned} 3(x-4) + 6 &= 5(x-1) + 1 \\ 3(x) + 3(-4) + 6 &= 5(x) + 5(-1) + 1 \\ 3x - 12 + 6 &= 5x - 5 + 1 \\ 3x - 6 &= 5x - 4 \\ 3x - 6 - 5x &= 5x - 4 - 5x \\ -2x - 6 &= -4 \\ -2x - 6 + 6 &= -4 + 6 \\ -2x &= 2 \\ -2x &= 2 \\ \frac{-2}{-2} &= \frac{2}{-2} \\ \boxed{x=-1} \end{aligned}$$

Convert the repeating decimal to a fraction.

5. $0.\overline{6}$

$$\frac{6}{9} = \frac{2}{3}$$

6. $1.\overline{1}$

$$\frac{1}{9} \text{ or } \frac{10}{9}$$

7. $4.\overline{4}$

$$4\frac{4}{9} \text{ or } \frac{40}{9}$$

Complete each sentence.

8. -11.3 is rational because it terminates (stops).
9. $\sqrt{19}$ is irrational because 19 is not a perfect square.
10. $0.08\overline{3}$ is rational because 3 is repeating (repeat rational!).
11. $2.1371938\dots$ is irrational because it does not terminate or repeat.

Evaluate each expression. Leave your answer in exponential form.

12. $3^4 \times 3^2$

$$3^{4+2} = \boxed{3^6}$$

13. $9^7 \times 9^3$

$$9^{7+3} = \boxed{9^{10}}$$

14. $6^3 \times 6^3$

$$6^{3+3} = \boxed{6^6}$$

REMEMBER: You can multiply exponential expressions with like bases by adding the exponents.

15. $5^5 \times 5^4$

$$5^{5+4} = \boxed{5^9}$$

16. $1^{11} \cdot 1^{-9}$

$$1^{11-9} = 1^2 = \boxed{1}$$

17. $x^3 \cdot x^{-6}$

$$x^{3-6} = x^{-3} = \frac{1}{x^3}$$

*Cannot have a negative exponent

18. $\frac{4^9}{4^7}$

$$4^{9-7} = \boxed{4^2}$$

19. $\frac{2^{-10}}{2^4}$

$$2^{-10-4} = 2^{-14} = \frac{1}{2^{14}}$$

20. $\frac{z^{20}}{z^{10}}$

$$z^{20-10} = \boxed{z^{10}}$$