

 Name: Master

## Algebra: Review

***Explain each of the following. Use examples to support your explanation:***

1. Expression

2. Equation

3. Variable

4. Balance

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**Evaluate each expression:**

5.  $4y + 5$ , if  $y = 10$

$$= 4(10) + 5$$

$$= 40 + 5$$

$$= 45$$

6.  $3c + 2y - 24$ , if  $c = (-2)$  and  $y = 4$

$$= 3(-2) + 2(4) - 24$$

$$= -6 + 8 - 24$$

$$= ~~4~~ - 22$$

7.  $2(x + y)$ , if  $x = 3.2$  and  $y = 1.4$

$$= 2(3.2 + 1.4)$$

$$= 2(4.6)$$

$$= 9.2$$

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**Solve and Check:**

8.  $c - 4 = 16$

$$c - 4 + 4 = 16 + 4$$
$$c = 20$$

$$c - 4 = 16$$

$$20 - 4 = 16$$
$$16 = 16$$

9.  $y + 7.3 = 5.4$

$$y + 7.3 - 7.3 = 5.4 - 7.3$$
$$y = -1.9$$

$$y + 7.3 = 5.4$$

$$-1.9 + 7.3 = 5.4$$
$$5.4 = 5.4$$

10.  $\frac{p}{2.5} = 24$

$$\frac{24}{2.5} = 24 \times 2.5$$
$$p = 60$$

$$\frac{p}{2.5} = 24$$

$$\frac{60}{2.5} = 24$$
$$24 = 24$$

11.  $6r = 1.2$

$$\frac{6r}{6} = \frac{1.2}{6}$$
$$r = 0.2$$

$$6r = 1.2$$

$$6 \times 0.2 = 1.2$$
$$1.2 = 1.2$$

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12.  $17 - z = 26$

~~$17 - z = 26$~~

$$17 - z + z = 26 + z - z$$

$$17 - 26 - 9 = z$$

13.  $\frac{135}{n} = 9$

~~$135 \cdot n = 9 \times 135$~~

$$\frac{135}{135} \cdot n = 9 \times 135$$
$$n = 1215$$

$17 - z = 26$

$$17 - (-9) = 26$$

$$26 = 26$$

$\frac{135}{n} = 9$

$$\frac{1215}{135} = 9$$

$$9 = 9$$

14.  $4w + 7 = 43$

$$4w + 7 - 7 = 43 - 7$$

$$\frac{4w}{4} = \frac{36}{4}$$

$$w = 9$$

**Group the like terms:**

15.  $3x + 5x$

$$\begin{matrix} x & x & x & x & x \\ x & x & x & x & x \\ x & x & x & x & x \end{matrix} = 8x$$

16.  $9t + 6w - b + 4b$

$$9t + 9b$$

$4w + 7 = 43$

$$4(9) + 7 = 43$$

$$36 + 7 = 43$$

$$43 = 43$$

17.  $6w - 5w + 3w + 8y$

$$4w + 8y$$

18.  $6t + 4w - 3t + 4t + 2w$

$$7t + 6w$$

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**Group the like terms, solve and check:**

19.  $5r + 7 - r - 2r + 3 = 8r + 12$

$$2r + 10 = 8r + 12$$

$$2r - 2r + 10 = 8r - 2r + 12$$

$$10 - 12 = 6r + 12 - 12$$

$$\frac{-2}{-6} = \frac{6r}{-6}$$

$$-0.3 = r$$

$$5r + 7 - r - 2r + 3 = 8r + 12$$

$$5(-.3) + 7 - (-.3) - 2(-.3) + 3 = 8(-.3) + 12$$

$$(-1.5) + 7 - (-.3) + 0.6 + 3 = -2.4 + 12$$

$$\frac{9.4}{9.4} = 9.6$$

20.  $10n + 12 - 9 - 7n + 4n = 2n + 31$

$$3n + 3 - 2n = 2n + 31 - 2n$$

$$5n + 3 - 3 = 31 - 3$$

$$\frac{5n}{5} = \frac{28}{5}$$

$$n = 5.6$$

$$10n + 12 - 9 - 7n + 4n = 2n + 31$$

$$10(5.6) + 12 - 9 - 7(5.6) + 4(5.6) = 2(5.6) + 31$$

$$56 + 12 - 9 - 39.2 + 22.4 = 11.2 + 31$$

$$42.2 = 42.2$$

**Expand:**

21.  $2(x + 5)$

$$2x + 10$$

22.  $4(2y + 1)$

$$8y + 4$$

23.  $2(3x + 2y)$

$$6x + 4y$$

24.  $-5(3s - t)$

$$-15s + 5t$$

$$\rightarrow -5(3s - (t))$$

$$-15s - (-5t)$$

$$= -15s + 5t$$

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**Solve and check:**

25.  $2(x + 1) = 6$

$$\begin{aligned} 2x + 2 &= 6 \\ 2x + 2 - 2 &= 6 - 2 \\ 2x &= 4 \\ \frac{2x}{2} &= \frac{4}{2} \end{aligned}$$

26.  $4 + 2s = 3(s - 2) + 1$

$$\begin{aligned} 4 + 2s &= 3s - 6 + 1 \\ 4 + 5 - 2s &= 3s - 2s + 5 \\ 9 &= 5 \end{aligned}$$

27.  $5(g - 3) + 5 = 3(g + 1)$

$$\begin{aligned} 5g - 15 + 5 &= 3g + 3 \\ 5g - 10 + 5 &= 3g + 3 - 3 \\ 5g - 13 + 5 &= 3g - 5 + 5 \\ \frac{-13}{-2} &= \frac{-29}{-2} \end{aligned}$$

6.5 = 9

28.  $3d - (3^2) - 7d + 4 = d + 6 + 2d + 5(2)$

$$\begin{aligned} 3d - 9 - 7d + 4 &= d + 6 + 2d + 10 \\ -4d - 5 + 5 &= 3d + 16 + 5 \\ -4d - 3d &= 3d + 21 - 1d \\ -7d &= 21 \\ \frac{-7d}{-7} &= \frac{21}{-7} \\ d &= -3 \end{aligned}$$

$$2(x + 1) = 6$$

$$\begin{aligned} 2(2 + 1) &= 6 \\ 2(3) &= 6 \\ 6 &= 6 \end{aligned}$$

$$4 + 2s = 3(s - 2) + 1$$

$$\begin{aligned} 4 + 2(9) &= 3(9 - 2) + 1 \\ 4 + 18 &= 3(7) + 1 \\ 22 &= 21 + 1 \\ 22 &= 22 \end{aligned}$$

$$5(g - 3) + 5 = 3(g + 1)$$

$$\begin{aligned} 5(6.5 - 3) + 5 &= 3(6.5 + 1) \\ 5(3.5) + 5 &= 3(7.5) \\ 17.5 + 5 &= 22.5 \\ 22.5 &= 22.5 \end{aligned}$$

$$3d - (3^2) - 7d + 4 = d + 6 + 2d + 5(2)$$

$$\begin{aligned} 3(-3) - 9 - 7(-3) + 4 &= -3 + 6 + 2(-3) + 10 \\ -9 - 9 + 21 + 4 &= -3 + 6 - 6 + 10 \\ 7 &= 7 \end{aligned}$$

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$$\begin{aligned} 29. \quad 5b + 4^2 - (-3b) - 2 + (-3) &= (-2)^3 + 5b - (-10) \\ 5b + 16 + 3b - 2 - 3 &= -8 + 5b + 10 \\ 8b + 11 - 11 &= 2 + 5b - 11 \\ 8b - 5b &= -9 + \cancel{5b} - \cancel{5b} \\ \frac{3b}{3} &= \frac{-9}{3} \\ b &= -3 \end{aligned}$$

$$\begin{aligned} &(-2)(-2)(-2) \\ &\quad \underbrace{\quad \quad \quad}_{(4)(-2)} \\ &\quad \quad \quad = -8 \end{aligned}$$

Check:

$$\begin{aligned} 5b + 4^2 - (-3b) - 2 + (-3) &= (-2)^3 + 5b - (-10) \\ 5(-3) + 16 - (-3(-3)) - 2 + (-3) &= -8 + 5(-3) + 10 \\ -15 + 16 - 9 - 2 - 3 &= -8 - 15 + 10 \\ &= -13 \end{aligned}$$

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$$30. (-5)^2 + 2m + (+2m) - (-1)^2 = m + (-2m) + (-1)^3$$

$$25 + 2m + 2m - 1 = m - 2m - 1$$

$$24 + 4m - 24 + m = -m - 1 - 24 + 1$$

$$\frac{5m}{5} = \frac{-24}{5}$$

$$m = -5$$

Check:

$$(-5)^2 + 2m + (+2m) - (-1)^2 = m + (-2m) + (-1)^3$$

$$25 + 2(-5) + (2(-5)) - (+1) = -5 + (-2(-5)) - 1$$

$$25 - 10 - 10 - 1 = -5 + 10 - 1$$

$$4 = 4$$



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**Write an equations, solve and check the following word problems:**

31. Three years from now, Jake's age will be sixteen. What is Jake's age now.

$$\begin{aligned} 3 \quad n + 3 &= 16 \\ n + \cancel{3} - 3 &= 16 - 3 \\ n &= 13. \end{aligned} \quad \therefore \text{Jake is } 13.$$

32. One year, Alberta had 250 forest fires more than Manitoba. The total number of forest fires in these two provinces was 1596 that year. How many forest fires did Manitoba have?

$$\begin{aligned} 2a + 250 &= 1596 \\ 2a + \cancel{250} - 250 &= 1596 - 250 \\ \frac{2a}{2} &= \frac{1346}{2} \\ \boxed{a = 673} \end{aligned} \quad \begin{aligned} \therefore \text{Manitoba had } 673 \text{ and Alberta} \\ \text{had } 925 \text{ for a total of} \\ 1596 \text{ forest fires.} \end{aligned}$$

33. Brie has \$2.50 more than Austin. Together, they have \$17.50. How much does Austin have?

$$\begin{aligned} 2b + 2.50 &= 17.50 \\ 2b + \cancel{2.50} - 2.50 &= 17.50 - 2.50 \\ \frac{2b}{2} &= \frac{15}{2} \\ \boxed{b = 7.5} \end{aligned} \quad \begin{aligned} \therefore \text{Austin has } \$7.50 \text{ and Brie} \\ \text{has } \$10.00 \text{ for a total of} \\ \$17.50. \end{aligned}$$

$$\boxed{b = 7.5} \text{ Austin} \rightarrow \text{Bri} = 7.5 + 2.50 = \$10.$$

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***Write an equation for yourself, answer it then check it. (Try and make it tough)***

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