Please evaluate each expression.

1) $\dfrac{16-3\cdot2}{1+4}$ $\dfrac{16-6}{5} = \dfrac{10}{5} =$ 1) __2__

2) $21+[6-12\div3]$ $21 + [6-4] = 21+2 =$ 2) __23__

3) $\dfrac{3}{4}(11-7)^2$ $\dfrac{3}{4}(4)^2 = \dfrac{3}{4}(16) =$ 3) __12__

Please evaluate each expression if $a=3$, $b=-4$, and $c=\dfrac{1}{4}$.

4) $a^2(b-a)$ $3^2(-4-3) = 9(-7) =$ 4) __-63__

5) $\dfrac{8c+ab}{c}$ $\dfrac{8\left(\frac{1}{4}\right)+3(-4)}{\frac{1}{4}} = \dfrac{2+-12}{\frac{1}{4}} = \dfrac{-10}{\frac{1}{4}}$ 5) __-40__

Please complete the table below by placing a check mark or X to indicate all sets of numbers that apply to the value of each expression.

		R real	I irrational	Q rational	Z integer	W whole	N natural
6)	0.4	✓		✓			
7)	$\sqrt{\dfrac{1}{4}} = \dfrac{1}{2}$	✓		✓			
8)	$-\sqrt{7}$	✓	✓				
9)	-15	✓		✓	✓		

10) What are the additive and multiplicative inverses of $1\dfrac{2}{3}$?

$1\dfrac{2}{3} =$ $\dfrac{5}{3} \cdot \dfrac{3}{5} = 1$ ✓

10) Additive: __$-1\dfrac{2}{3}$__

Multiplicative: __$\dfrac{3}{5}$__

Please name the property illustrated by each equation or statement.

11) If $x - 2 = 5$, then $x = 7$.

11) _addition_

12) $(3 \cdot 4) \cdot 9 = 3 \cdot (4 \cdot 9)$

12) _associative_

13) If $a = b$ and $b = -2$, then $a = -2$.

13) _transitive_

Please solve each equation or formula for the specified variable.

14) $y(x + z) - v = 3d$ for y

14) $y = \dfrac{3d + v}{x + z}$

$\underline{+v \quad +v}$

$\dfrac{y(x + z)}{(x + z)} = \dfrac{3d + v}{(x + z)}$

$y = \dfrac{3d + v}{x + z}$

15) $y \cdot \dfrac{10z + x}{y} = 4 \cdot y$ for x

15) $x = 4y - 10z$

$10z + x = 4y$

$\underline{-10z \qquad -10z}$

$x = 4y - 10z$

Please solve each equation.

16) $6m - 4 = -46$

16) $m = -7$

$\underline{+4 \quad +4}$

$6m = -42$, so $m = -7$

17) $\dfrac{d}{2} + \dfrac{d}{4} = 3$

17) $d = 4$

method 1:

$4\left(\dfrac{d}{2} + \dfrac{d}{4}\right) = (3)4$

$2d + d = 12$

$3d = 12$

$d = 4$

method 2:

$\dfrac{2}{2} \cdot \dfrac{d}{2} + \dfrac{d}{4} = 3$

$\dfrac{2d}{4} + \dfrac{d}{4} = 3$ (common denominators)

$\dfrac{4}{3} \cdot \dfrac{3d}{4} = 3 \cdot \dfrac{4}{3}$ (mult. by recip)

$d = 4$

18) $5-(2w-8)=6w-9$ distribute the negative   18) $\underline{\quad w=\dfrac{11}{4} \quad}$

$$5-2w+8=6w-9$$
$$13-2w=6w-9$$
$$\underline{+9 \ +2w \quad +2w \ +9}$$
$$\frac{22}{8}=\frac{8w}{8}$$

$$w=\frac{22}{8} \quad \frac{11}{4}$$

19) $|x-3|=1$ (bifurcate)   19) $\underline{\dfrac{x=4 \text{ or}}{x=2}}$

$$x-3=1 \qquad x-3=-1$$
$$\underline{+3 \ +3} \qquad \underline{+3 \ +3}$$
$$x=4 \quad \text{or} \quad x=2$$

20) $\dfrac{2|3e-2|}{2}=\dfrac{14}{2}$ 20) $\underline{\dfrac{e=3 \text{ or}}{e=-5/3}}$

$$|3e-2|=7 \qquad \text{bifurcate}$$

$$3e-2=7 \qquad\qquad 3e-2=-7$$
$$\underline{+2 \ +2} \qquad\qquad \underline{+2 \quad +2}$$
$$3e=9 \qquad\qquad\quad 3e=-5$$
$$e=3 \quad \text{or} \quad e=-5/3$$

21) $|3x-8|=-15$ 21) $\underline{\quad\varnothing\quad}$

Since absolute value expressions always result in positive #'s, they can't equal -15 thus, no solution can work for x

Please solve each inequality. Then graph the solution set on a number line.

22) $-3y + 4 \geq -7$

$-4 \quad +4$

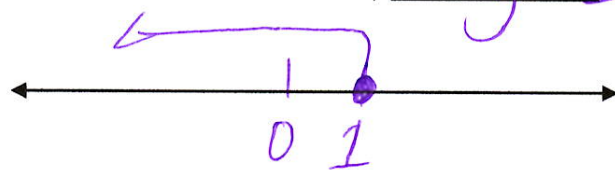$\dfrac{-3y}{-3} \geq \dfrac{-3}{-3}$ (flipped the inequality)

$y \leq 1$

22) $\underline{\quad y \leq 1 \quad}$

23) $|2x + 3| \geq 11$

$2x + 3 \geq 11$ or $2x + 3 \leq -11$

$\quad -3 \quad -3 \qquad\qquad -3 \quad -3$

$2x \geq 8 \qquad\qquad 2x \leq -14$

$x \geq 4$ or $\qquad x \leq -7$

23) $\underline{\quad x \geq 4 \text{ or } x \leq -7 \quad}$
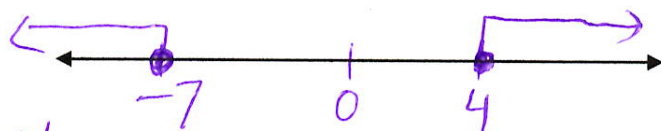
24) $|3x - 4| < -7$

absolute value expressions can't be less than -7

24) $\underline{\quad \varnothing \quad}$
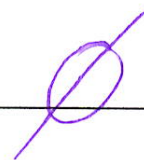
25) $2a + 12 \leq 6$ or $3a - 1 > -13$

$\quad -12 \, -12 \qquad +1 \quad +1$

$2a \leq -6 \qquad 3a > -12$

$a \leq -3$ or $a > -4$
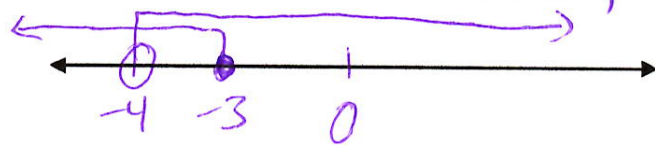
Since every number is either greater than or equal to -3, or greater than -4, or both, any # works

(every # is covered)

25) $\underline{\quad \mathbb{R} \quad}$