MAT 0028

1. Simplify: $35 - 16 \div 8 + 3$

2. Simplify: $4^2 + 12 \bullet 13 - (25 + 25 \bullet 4)$

3. Evaluate: $3a^2 + 5b - c$ when $a = -1, b = 2$, and $c = -2$

4. Simplify: $-|-5| - |2| + |3|$

5a. Simplify: $7(x-1) - 2(3x+5)$

5b. Simplify: $-3[10 - 8(3-2x) - 4x]$

6a. Solve: $7y - 5 = 2y + 4y$

6b. Solve: $5x + 4(2x-3) = 2x + 11$

7. Solve: $x + \dfrac{1}{5} = -\dfrac{3}{10}$

8. Solve for "y" : $3x + 2y = 5$

9: Solve: $3(2x+5) < 7x + 6$

10. Translate "the difference between five times a number and three equals six more than twice the number" into an equation.

11a. The length of a rectangle is 4 meters less than the width. The perimeter is 40 meters. Find the length.

   b. $550 is invested for 4 years at 6% simple interest. How much interest is earned in 4 years?

12. Set up the correct proportion:

   If there are 240 calories in 15 grams of a food, how many calories are in 20 grams of the same food?

13a. Simplify: $(3x^4 y^2)^3$

   b. Simplify $\dfrac{2x^3 y}{10x^2 y^5}$

14a. Simplify: $(4x^{-3} y^5)^{-2}$

   b. Simplify: $\dfrac{-2x^4 y^2}{12x^3 y^{-5}}$

   c. Simplify: $x^{-3} \cdot x^{-2}$

15a. Simplify: $-(4x)^0$

15b. Simplify: $\dfrac{3x^2 y^0}{6x^{-3} y}$

16a. Change to Scientific Notation: 62,700,000

  b. Convert to standard form: 6.21×10^{-4}

17. Simplify: $(x^2 - 3x + 8) - (-5x^2 + 3x - 17)$

18. Simplify: $-3x^2 y(2x^2 - 5xy + xy^2)$

19a. Simplify: $(3x - 2)(x + 4)$

  b. Simplify: $(2x-5y)^2$

20. Factor: $12x^2 y^4 - 30xy^7$

21. Which of the following is a factor of $8x^2 - 14x - 15$?

A)$(2x + 5)$ B) $(8x - 1)$ C) $(4x + 3)$ D) None of the above

22. Factor: $9x^2 - 25y^2$

23. Factor Completely: $x^3 + 4x^2 + 2x + 8$

24. Simplify: $\dfrac{x^2 - 36}{x^2 - x - 30}$

25. Solve: $x^2 - 3x - 28 = 0$

26. Solve: $2x^2 - 5x - 3 = 0$

27. Simplify (the variable represents a non-negative number): $\sqrt{75x^5}$

28. Simplify: $\sqrt{20} - \sqrt{45}$

29. Find the x intercept of $5x + 2y = 6$

30a. Graph: $4x + 5y = 20$

  b. Graph: $y = 2x - 3$

Sample Final Answer Sheet

(1) $35 - 2 + 3 = 33 + 3 = 36$

(2) $16 + 156 - (25 + 100) = 172 - 125 = 47$

(3) $3(-1)^2 + 5(2) - (-2) = 3(1) + 10 + 2 = 3 + 10 + 2 = 15$

(4) $-5 - 2 + 3 = -7 + 3 = -4$

(5)a $\quad 7x - 7 - 6x - 10 = x - 17$ $\qquad$ (5)b $\quad -3[10 - 24 + 16x - 4x] = -3[-14 + 12x] = 42 - 36x$

(6)a
$$5x + 8x - 12 = 2x + 11$$
$$13x - 12 = 2x + 11$$
$$11x = 23$$
$$x = \frac{23}{11}$$

(6)b
$$7y - 5 = 6y$$
$$y - 5 = 0$$
$$y = 5$$

(7) $10x + 10\left(\frac{1}{5}\right) = 10\left(-\frac{3}{10}\right)$ multiply by 10
$$10x + 2 = -3$$
$$10x = -5$$
$$x = \frac{-5}{10} = \frac{-1}{2}$$

(8) $2y = 5 - 3x$ or $-3x + 5$
$$y = \frac{5 - 3x}{2} \text{ or } \frac{-3x + 5}{2}$$

(9) $\quad 6x + 15 < 7x + 6$
$$9 < x \text{ or } x > 9$$

(10) $\quad 5n - 3 = 2n + 6$

(11)a. $L = W - 4; P = 40$
$$P = 2L + 2W$$
$$40 = 2(W - 4) + 2W$$
$$40 = 2W - 8 + 2W$$
$$40 = 4W - 8$$
$$48 = 4W$$

$12m = W$ thus $L = 12 - 4 = 8m$

(11) b. $I = PRT$
$$I = (\$550)(0.06)(4)$$
$$I = \$132$$

(12) $\quad \dfrac{240cal.}{15g} = \dfrac{x}{20g}$ or $\dfrac{x}{240cal} = \dfrac{20g}{15g}$

(13)a. $27x^{12}y^6$ $\qquad$ b. $\quad \dfrac{x}{5y^4}$

(14)a. $4^{-2}x^6 y^{-10}$
$$= \frac{x^6}{16y^{10}}$$

b. $\dfrac{-xy^2 y^5}{6}$
$$= \frac{-xy^7}{6}$$

c. $\dfrac{1}{x^3} \bullet \dfrac{1}{x^2}$
$$= \frac{1}{x^5}$$

(15)a $\quad -(4x)^0 = -(1) = -1$ $\qquad$ (15)b $\quad \dfrac{x^2 x^3}{2y}$ recall $y^0 = 1$ thus $\dfrac{x^5}{2y}$

(16)a 6.27×10^7 (16)b.   0.000621

(17) $x^2 - 3x + 8 + 5x^2 - 3x + 17$
       $= 6x^2 - 6x + 25$

(18) $-6x^4y + 15x^3y^2 - 3x^3y^3$

(19)a. $3x^2 + 12x - 2x - 8 = 3x^2 + 10x - 8$
    b. $(2x - 5y)(2x - 5y) = 4x^2 - 10xy - 10xy + 25y^2 = 4x^2 - 20xy + 25y^2$

(20) $6xy^4(2x - 5y^3)$

(21) $(2x - 5)(4x + 3)$ thus C

(22) $(3x + 5y)(3x - 5y)$

(23) $x^2(x + 4) + 2(x + 4)$
       $= (x + 4)(x^2 + 2)$

(24) $\dfrac{(x-6)(x+6)}{(x-6)(x+5)} = \dfrac{x+6}{x+5}$ factor & cancel
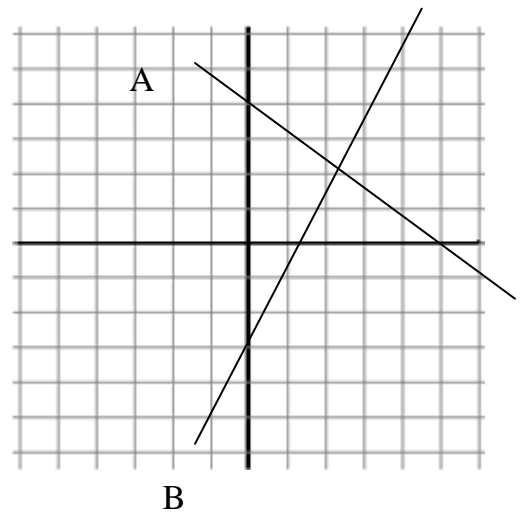
(25) $(x - 7)(x + 4) = 0$ (26) $(2x + 1)(x - 3) = 0$
       $x - 7 = 0$ or $x + 4 = 0$ $2x + 1 = 0$ or $x - 3 = 0$
         $x = 7$ or $x = -4$ $x = \dfrac{-1}{2}$ or $x = 3$ $\{-\frac{1}{2}, 3\}$
         $\{-4, 7\}$

(27) $\sqrt{(25)(3)(x^4)} = 5x^2\sqrt{3x}$ or   by using primes $\sqrt{3 \cdot 5 \cdot 5 \cdot x \cdot x \cdot x \cdot x \cdot x} = 5x^2\sqrt{3x}$

(28) $\sqrt{4 \cdot 5} - \sqrt{9 \cdot 5} = 2\sqrt{5} - 3\sqrt{5} = -\sqrt{5}$

(29)   let $y = 0$ $5x = 6$ thus $x = \dfrac{6}{5}$ thus $(\frac{6}{5}, 0)$

A

B

(30)a   using intercepts: let x = 0 then y=4 plot (0,4)
                       let y=0 then x=5 plot (5,0)

     b. plot any two points: let x=0 then y=-3 plot (0,-3)
                         let x=2 then y=1 plot (2,1)
        or use slope and intercept method $m = 2$ and y intercept = (0, -3)