

## BWHS Next Level Advancement Test Study Guide

Multiple choice. Choose the letter that best answers each question. You do not need to show work.

- (1). What is the solution to the following system?

$$\begin{aligned} -2x + y &= 5 \\ x + y &= -1 \end{aligned}$$

- (A). (2, -1)  
 (B). (-1, 2)  
 (C). no solution  
 (D). (-2, 1)

- (3). If
- $g(x) = x^2 + x - 1$
- , find
- $g(2)$

- (A). 6  
 (B). 7  
 (C). 2  
 (D). 5

- (5). Find the axis of symmetry for the following quadratic equation.

$$x^2 + 6x + 12 = 0$$

- (A).  $x = 0$   
 (B).  $y = 0$   
 (C).  $y = -3$   
 (D).  $x = -3$

- (7). Simplify:
- $5\sqrt{12}$

- (A).  $2\sqrt{3}$   
 (B).  $20\sqrt{3}$   
 (C).  $10\sqrt{3}$   
 (D).  $15\sqrt{2}$

- (9). Simplify:
- $x^6 \cdot \frac{1}{x^2}$

- (A).  $x^3$   
 (B).  $x^2$   
 (C).  $\frac{1}{x^6}$   
 (D).  $\frac{1}{x^2}$   
 (E).  $x^4$

- (11). Simplify:
- $\frac{60}{\sqrt{5}}$

- (A).  $2\sqrt{3}$   
 (B). 12  
 (C).  $60\sqrt{5}$   
 (D). 60  
 (E).  $12\sqrt{5}$

- (2). If
- $f(x) = 2x^2 - x + 5$
- , find
- $f(-1)$

- (A). 8  
 (B). 2  
 (C). 4  
 (D). 6

- (4). Solve
- $2^x = 2^{3x-2}$

- (A). -4  
 (B). 2  
 (C). 1  
 (D). 0

- (6). Which exponential equation shows exponential decay with an initial value of 50 and a decay rate of 5%?

- (A).  $y = 50^{-0.05x}$   
 (B).  $y = 50(0.05)^x$   
 (C).  $y = 50x^{0.05}$   
 (D).  $y = 50(0.95)^x$

- (8). Simplify:
- $\sqrt{20}$

- (A).  $5\sqrt{4}$   
 (B).  $4\sqrt{5}$   
 (C).  $2\sqrt{20}$   
 (D).  $2\sqrt{5}$

- 10). Simplify:
- $\frac{x^{-10}}{x^{-9}}$

- (A).  $x$   
 (B).  $\frac{1}{x}$   
 (C).  $x^{90}$   
 (D).  $x^{19}$   
 (E).  $\frac{1}{x^{19}}$

- (12). Solve the equation.

$$(x - 3)^2 = 36$$

- (A). 39  
 (B). no solution  
 (C). 9 and -3  
 (D). 9 and 6  
 (E). -9 and -6

(13). Solve the equation.

$$9(x + 5)^2 = -81$$

- (A). 4 and -14
- (B). 4 and 14
- (C). all real numbers
- (D). no real solution
- (E). 0

(15). Simplify:  $(6x)^{-1}$

- (A).  $-6x$
- (B).  $\frac{-6}{x}$
- (C).  $\frac{1}{6x}$
- (D).  $\frac{6}{x}$
- (E).  $\frac{-1}{6x}$

(17). Simplify:  $x^{-3} \cdot x^3$

- (A). 0
- (B).  $\frac{1}{x^9}$
- (C). 1
- (D).  $x$
- (E).  $-x^9$

(19). Simplify:  $5x^{-2}$

- (A).  $\frac{1}{5x^2}$
- (B).  $\frac{5}{x^2}$
- (C).  $-5x^2$
- (D).  $-25x^2$
- (E).  $\frac{-5}{x^2}$

(21). Which of the following is a cubic monomial?

- (A).  $-4x^3$
- (B).  $3x^2 - 6x + 12$
- (C).  $2x + 3$
- (D).  $6x^4$
- (E).  $x^3 + 5x - 1$

(14). Solve the equation.

$$2w^2 - 13 = -11$$

- (A). 1 and 0
- (B). 1 and -1
- (C). no solution
- (D). all real numbers
- (E). 2 and -2

(16). Simplify:  $8x^{-5} \cdot 6x^3$

- (A).  $\frac{48}{x^{15}}$
- (B).  $-48x^2$
- (C).  $-96x$
- (D).  $\frac{48}{x^2}$
- (E).  $-48x^{15}$

(18). Which of the following is a quadratic binomial?

- (A).  $3x^4 - 5x$
- (B).  $9x^2 + 4x - 2$
- (C).  $5x^2 - x$
- (D).  $4x^3 - x^2 + 8x + 3$
- (E).  $7x^4 + 8x^2 - 10$

(20). Simplify:  $(x + 3)^2$

- (A).  $x^2 + 6$
- (B).  $x^2 + 9$
- (C).  $8x + 9$
- (D).  $x^2 + 6x + 9$
- (E).  $2x + 9$

(22). Which of the following is a quartic trinomial?

- (A).  $-9x^3$
- (B).  $3x^2 - 5x + 8$
- (C).  $7x^4 + 3$
- (D).  $4x^3 - 2x^2 - x - 9$
- (E).  $7x^4 + 8x - 2$

(23) Which of the following is the correct factored form of  $x^2 - 16$  ?

- (A).  $(x + 8)(x - 8)$
- (B).  $(x - 4)^2$
- (C).  $(x - 8)(x + 2)$
- (D).  $(x - 4)(x + 4)$
- (E).  $x(x - 16)$

(25). Solve:  $x^2 - 4 = 0$

- (A). no solution
- (B). 1 and -1
- (C). 2 and -2
- (D). 4 and -4
- (E). 2

(27). Multiply and simplify:  $(2x - 9)(x - 4)$

- (A).  $2x^2 + 36$
- (B).  $-15x + 36$
- (C).  $2x^2 - 17x + 36$
- (D).  $2x^2 - x + 36$
- (E).  $3x^2 - 17x + 36$

(29) Does the following function have a minimum or maximum? What is the min. or max.?

$$f(x) = -x^2 + 2x + 1$$

- (A). minimum, 1
- (B). minimum, 2
- (C). maximum, 1
- (D). maximum, 2
- (E). neither

(31). Evaluate  $(4x)^2$  when  $x = 3$

- (A). 144
- (B). 36
- (C). 24
- (D). 48

(24). What would be added to the equation to complete the square?

$$x^2 + 2x = 3$$

- (A). 4
- (B). -4
- (C). 1
- (D). -1

(26). Which of the following is the correct factored form of  $3x^2 - 7x - 20$

- (A).  $(3x - 5)(x + 4)$
- (B).  $(3x + 10)(x - 2)$
- (C).  $(3x - 10)(x + 2)$
- (D).  $(3x + 5)(x - 4)$
- (E).  $(3x + 5)(3x - 4)$

(28). Subtract the polynomials and simplify:  
 $(5x^3 + 7x^2 - 9x) - (8x^3 - 3x^2 - 2x - 1)$

- (A).  $-3x^3 + 10x^2 - 7x + 1$
- (B).  $-3x^3 + 4x^2 - 11x + 1$
- (C).  $-3x^6 + 10x^4 - 7x^2 + 1$
- (D).  $-3x^3 + 10x^2 + 11x - 1$
- (E).  $-3x^6 + 4x^4 - 11x^2 + 1$

(30). Which of the following is a zero of the equation  $x^2 + 3x + 2 = 0$  ?

- (A). (2, 0)
- (B). (-2, 0)
- (C). (0, -2)
- (D). (0, 2)
- (E). (0, 0)

(32). Simplify:  $(8x^3)^2$

- (A).  $16x^6$
- (B).  $64x^5$
- (C).  $16x^5$
- (D).  $64x^9$
- (E).  $64x^6$

(33). What is the slope of a horizontal line?

- (A). undefined
- (B). 1
- (C). 0
- (D).  $y$

(35). Evaluate  $10 - x^3$  for  $x = -2$

- (A). 16
- (B). 18
- (C). 4
- (D). 2

(37). In which quadrant is the point  $(5, -3)$  located?

- (A). quadrant I
- (B). quadrant II
- (C). quadrant III
- (D). quadrant IV

(39). Solve the equation:  $5 - 8x = -4(2x + 1)$

- (A). no solution
- (B).  $x = \frac{1}{16}$
- (C).  $x = \frac{9}{16}$
- (D).  $x =$  all Real numbers

(41) Find the median of the data below.

55, 42, 51, 66, 88, 102, 86

- (A). 66
- (B). none
- (C). 70
- (D). 490
- (E). 0

(43) Evaluate the expression  $12x^3 - 3x$  when  $x = -2$

- (A). -90
- (B). 10
- (C). -102
- (D). -66

(45). Find the slope of a line through the points  $(12, 8)$  and  $(7, 8)$

- (A).  $\frac{19}{17}$
- (B). undefined
- (C).  $\frac{16}{5}$
- (D). 0

(34). What is the slope of a vertical line?

- (A). 0
- (B). undefined
- (C). 1
- (D).  $x$

(36). Simplify:  $5(8x - 1)$

- (A).  $40x - 5$
- (B).  $35x$
- (C).  $40x - 6$
- (D).  $40x - 4$

(38). In which quadrant is the point  $(-1, -2)$  located?

- (A). quadrant I
- (B). quadrant II
- (C). quadrant III
- (D). quadrant IV

(40). Find the slope of the line through the points  $(8, 12)$  and  $(8, 7)$

- (A).  $\frac{5}{16}$
- (B). undefined
- (C).  $\frac{19}{16}$
- (D). 0

(42). Find the mean of the data below.

55, 42, 51, 66, 88, 102, 86

- (A). 66
- (B). none
- (C). 70
- (D). 490
- (E). 0

(44) Find the mode of the data below.

55, 42, 51, 66, 88, 102, 86

- (A). 66
- (B). none
- (C). 70
- (D). 490
- (E). 0

(46). Evaluate the expression  $nm^3$  when  $n = 18$  and  $m = -5$

- (A). -107
- (B). 2197
- (C). -270
- (D). -2250

(47). the inequality:  $2(3x + 1) > 2 + 6x$

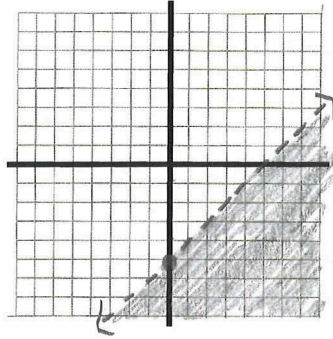
- (A). no solution
- (B).  $x = 0$
- (C).  $x = -\frac{1}{3}$
- (D).  $x =$  all Real numbers

(48). Solve  $|2x - 4| + 1 = 5$

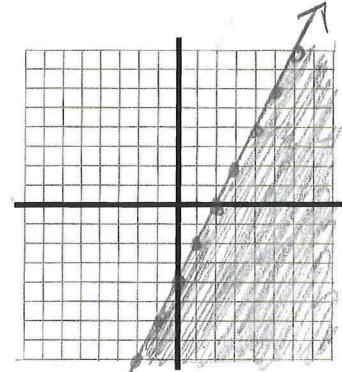
- (A). 4 and 0
- (B). 4
- (C). 4 and -1
- (D). 4.5 and -0.5

Graphing: On all grids, the increments along both axes are one unit. Do not change this increment size or add on to the grid. Graph each equation/inequality on the grid provided.

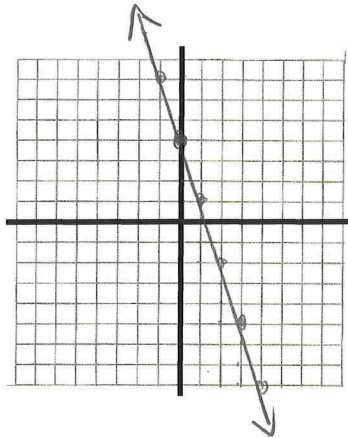
(49).  $y < x - 5$



(50).  $y \leq 2x - 4$

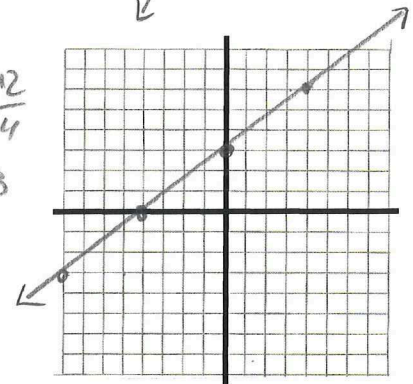


(51).  $y = -3x + 4$



(52).  $-3x + 4y = 12$

$$\begin{aligned} -3x + 4y &= 12 \\ +3x & \quad +3x \\ \hline 4y &= 3x + 12 \\ \frac{4y}{4} &= \frac{3x}{4} + \frac{12}{4} \\ y &= \frac{3}{4}x + 3 \end{aligned}$$

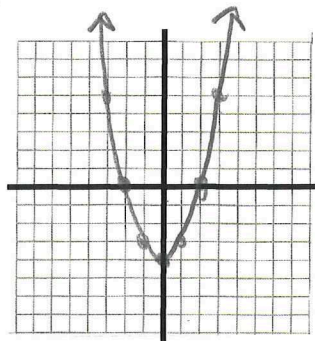


(53) Graph the quadratic by finding the axis of symmetry, vertex and 4 other points.

$$f(x) = x^2 - 4$$

axis of symmetry  
 $x = 0$

vertex  $(0, -4)$

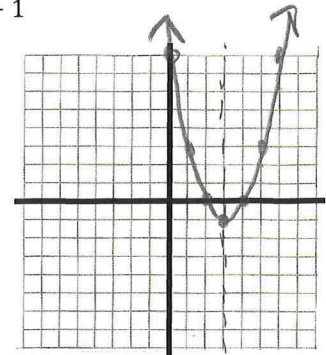


(54). Graph the quadratic by finding the axis of symmetry, vertex and 4 other points.

$$f(x) = (x - 3)^2 - 1$$

axis of symmetry  
 $x = 3$

vertex  $(3, -1)$

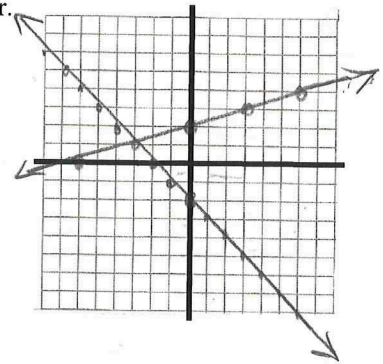


(55). Graph both lines on the grid provided. Then state the solution to the system on the answer line provided. Be sure to show all work supporting your graph. Write the solution as an ordered pair.

$$\begin{aligned} x - 3y &= -6 \\ y &= -x - 2 \end{aligned}$$

$$\begin{aligned} x - 3y &= -6 \\ -x & \quad -x \\ \hline -3y &= -x - 6 \\ \frac{-3y}{-3} &= \frac{-x - 6}{-3} \\ y &= \frac{1}{3}x + 2 \end{aligned}$$

solution  
 $(-3, 1)$



(56). Classify each given number by placing a check in each column that corresponds to a group to which that number belongs.

| Number          | Natural number | Whole number | Integer | Rational number | Irrational number | Real number |
|-----------------|----------------|--------------|---------|-----------------|-------------------|-------------|
| $\sqrt{25}$     | X              | X            | X       | X               |                   | X           |
| $-4\frac{3}{5}$ |                |              |         | X               |                   | X           |
| 16              | X              | X            | X       | X               |                   | X           |
| $\sqrt{14}$     |                |              |         |                 | X                 | X           |
| $8\bar{3}$      |                |              |         | X               |                   | X           |
| -12             |                |              | X       | X               |                   | X           |

Functions: Determine if each given relation is a function. Answer "yes" or "no." Then explain the reason.

(57).

| input | output |
|-------|--------|
| -2    | -4     |
| -1    | -1     |
| 2     | -2     |
| 2     | 5      |

ans: NO

explain:

The x-value of 2 has two different y-value outputs

(58).

| input | output |
|-------|--------|
| -3    | 0      |
| 0     | 2      |
| 1     | 1      |
| 3     | 1      |

ans: Yes

explain:

Every x-value has one y-value output

Complete each free response question. Remember to show supporting work. **NO DECIMALS!** Express all decimal answers as fractions in lowest terms or as a radical in simplest radical form.

(59) Solve the equation:

$$\begin{aligned} 32 &= 17 - \frac{5}{6}x \\ -17 & \quad -17 \\ \hline -\frac{6}{5} \cdot 15 &= \frac{-5}{6}x \cdot \frac{-6}{5} \\ -18 &= x \end{aligned}$$

(60). Solve the equation:

$$\begin{aligned} 2(x-4) - 3 &= -7 \\ 2x - 8 - 3 &= -7 \\ 2x - 11 &= -7 \\ +11 & \quad +11 \\ \hline 2x &= 4 \\ \frac{2x}{2} &= \frac{4}{2} \\ x &= 2 \end{aligned}$$

(61). Solve the equation:  $2x - 5(x-9) = 29 - x$

$$2x - 5x + 45 = 29 - x$$
$$\cancel{-3x} + 45 = \cancel{29} - x$$
$$\cancel{+5x} - 29 \cancel{+29} + 3x$$
$$\frac{16}{2} = \frac{16}{2}$$

$x = 8$

(63). Solve the equation:

~~$\frac{9}{x} = \frac{10}{x-1}$~~

$$9(x-1) = 10x$$
$$9x - 9 = 10x$$
$$\cancel{-9x} - 9 \cancel{-9x}$$

$-9 = x$

(65). Simplify the expression:  $-3(3x+2)+4$

$$-9x - 6 + 4$$

$-9x - 2$

(67). Evaluate the expression  $9x^3 + 2y^2$  for  $x = -4$  and  $y = -5$

$$9(-4)^3 + 2(-5)^2$$
$$9(-64) + 2(25)$$
$$-576 + 50$$

$-526$

(69). Find the slope of the line that line perpendicular to the line that passes through the points  $(-12, 2)$  and  $(3, -1)$ .

$x_1, y_1$      $x_2, y_2$

$$m = \frac{-1-2}{3+12} = \frac{-3}{15} = -\frac{1}{5}$$

$\perp m = -\frac{5}{1}$  or  $-5$

(71). Solve using the quadratic formula.

$$x^2 - 2x - 15 = 0$$

$a = 1$      $b = -2$      $c = -15$

$$x = \frac{2 \pm \sqrt{(-2)^2 - 4(1)(-15)}}{2} = \frac{2 \pm \sqrt{4+60}}{2}$$

$$= \frac{2 \pm \sqrt{64}}{2} = \frac{2 \pm 8}{2}$$

$$x = \frac{2+8}{2} \text{ or } x = \frac{2-8}{2}$$

$x = 5$  or  $x = -3$

(62). Solve the equation:  $8 + \frac{x}{6} = 26$

~~$\frac{8}{8} - 8$~~

~~$\frac{x}{6} = 18.6$~~

$x = 108$

(64). Simplify the expression:  $9(-x+7) - (3x-8)$

$$-9x + 63 - 3x + 8$$

$-14x + 71$

(66). Find the slope of the line with equation  $8x + 14y = -35$

~~$-8x - 8x$~~

$$14y = \frac{-8x}{14} - \frac{35}{14}$$

$$y = -\frac{4}{7}x - \frac{5}{2}$$

$m = -\frac{4}{7}$

(68). Find the slope of the line that passes through the points  $(-8, 3)$  and  $(-2, 7)$

$x_1, y_1$      $x_2, y_2$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7-3}{-2+8} = \frac{4}{6} = \frac{2}{3}$$

$m = \frac{2}{3}$

(70). Find the coordinate point of the vertex of the quadratic equation.

$$y = x^2 - 12x + 2 \quad a=1 \quad b=-12 \quad c=2$$

$$h = \frac{-b}{2a} = \frac{12}{2(1)} = 6$$

$$k = (6)^2 - 12(6) + 2 = 36 - 72 + 2 = -34$$

$(6, -34)$

(72). Simplify.  $\sqrt{75}$

$$\sqrt{75} \cdot \sqrt{3}$$

$$5 \cdot \sqrt{3}$$

$5\sqrt{3}$

(73). Solve for x:  $2x^2 + 3x - 4 = 0$

$a=2 \quad b=3 \quad c=-4$

$$x = \frac{-3 \pm \sqrt{(3)^2 - 4(2)(-4)}}{2(2)} = \frac{-3 \pm \sqrt{9+32}}{4}$$

$$x = \frac{-3 \pm \sqrt{41}}{4}$$

(75). Solve for x:  $25x^2 - 6 = 10$   
 $-10 \quad -10$

$$25x^2 - 16 = 0$$

$$(5x+4)(5x-4) = 0$$

$$5x+4=0 \quad 5x-4=0$$

$$\frac{5x}{5} = \frac{-4}{5} \quad \frac{5x}{5} = \frac{4}{5}$$

$$x = \frac{-4}{5} \text{ or } x = \frac{4}{5}$$

(77). Solve the system of equations using the substitution method:

$$3x - y = -1 \Rightarrow y = 3x + 1$$

$$2x + 3y = 25$$

$$2x + 3(3x+1) = 25 \quad y = 3(2) + 1$$

$$2x + 9x + 3 = 25 \quad y = 6 + 1$$

$$11x + 3 = 25 \quad y = 7$$

$$\frac{11x}{11} = \frac{22}{11} \quad (2, 7)$$

(79). Simplify:  $(3x^4 y^3)(-x^2 y)$

$$3(-1)x^4 x^2 y^3 y$$

$$-3x^6 y^4$$

(81). Simplify:  $\frac{8w^{-4}xy^{-1}}{24w^{-9}x^3y^5}$

$$\frac{8}{24} w^{-4-(-9)} x^{1-3} y^{-1-5}$$

$$\frac{1}{3} w^5 x^{-2} y^{-6}$$

$$\frac{w^5}{3x^2 y^6}$$

(74). Solve for x:  $x^2 - 5x = 24$

$$x^2 - 5x - 24 = 0$$

$$(x-8)(x+3) = 0$$

$$x-8=0 \quad x+3=0$$

$$x = 8 \text{ or } x = -3$$

(76). Solve for x:  $3x^2 - 12 = -5x$   
 $+5x$

$$3x^2 + 5x - 12 = 0$$

$$(3x-4)(x+3) = 0$$

$$3x-4=0 \quad x+3=0$$

$$\frac{3x}{3} = \frac{4}{3} \quad x = -3$$

$$x = \frac{4}{3} \text{ or } x = -3$$

(78). Solve the system of equations using the elimination method:

$$2(3x + 5y = -2) \cdot 3$$

$$-3(2x - 3y = 24) \cdot 5$$

$$\begin{array}{r} 6x + 10y = -4 \\ + \quad -6x + 9y = -72 \\ \hline 19y = -76 \end{array} \quad \begin{array}{r} 9x + 15y = -6 \\ + \quad 10x - 15y = 120 \\ \hline 19x = 114 \end{array}$$

$$\frac{19y}{19} = \frac{-76}{19} \quad \frac{19x}{19} = \frac{114}{19}$$

$$y = -4 \quad x = 6$$

$$(6, -4)$$

(80). Simplify:  $(4w^3xy^5)^2$

$$(4)^2 (w^3)^2 x^2 (y^5)^2$$

$$16w^6x^2y^{10}$$

(82). Multiply. Write the final answer polynomial in standard form:

$$(x+2)(x^2+4x-5)$$

$$x^3 + 4x^2 - 5x + 2x^2 + 8x - 10$$

$$x^3 + 6x^2 + 3x - 10$$



Multiply or factor each of the following. Supporting work is **NOT** required but encouraged. Combine all like terms in final answer when applicable

(83). Multiply. Write the final answer polynomial in standard form:

$$(3x + 2)^2$$

$$9x^2 + 12x + 4$$

(85). Factor the polynomial:  $x^2 - 36$

$$(x + 6)(x - 6)$$

(87). Factor the polynomial:  $2x^3 - 20x^2 + 48x$

$$2x(x^2 - 10x + 24)$$

$$2x(x - 6)(x - 4)$$

(89). Factor the polynomial:  $x^2 + 11x + 30$

$$(x + 6)(x + 5)$$

(91). Factor the polynomial:  $5x^2 - 45$

$$5(x^2 - 9)$$

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

(84). Multiply. Write the final answer polynomial in standard form:

$$-4xy^2(-5x^3y + 2x^2y^2 - 9xy^3)$$

$$20x^4y^3 - 8x^3y^4 + 36x^2y^5$$

(86). Factor the polynomial:  $2x^2 + 7x - 15$

$$(2x - 3)(x + 5)$$

(88). Factor the polynomial:  $2x^3 - 3x^2 + 14x - 21$

$$x^2(2x - 3) + 7(2x - 3)$$

$$(2x - 3)(x^2 + 7)$$

(90). Factor the polynomial:  $2x^2 + 9x + 4$

$$(2x + 1)(x + 4)$$

(92). Factor the polynomial:  $5x^3 - 2x^2 - 20x + 8$

$$x^2(5x - 2) - 4(5x - 2)$$

$$(x^2 - 4)(5x - 2)$$

$$(x + 2)(x - 2)(5x - 2)$$

(93). Factor the polynomial:  $x^2 - 10x + 25$

$$(x-5)^2 \text{ or } (x-5)(x-5)$$

(94). Factor the polynomial:  $49x^2 - 16$

$$(7x+4)(7x-4)$$

For each problem, define the variables. Write two equations in terms of those variables to represent the problem. Solve using either the substitution method or elimination method. Complete supportive work must be shown. Write each final answer on the answer line provided.

(95). Tickets to a play cost \$9 for adults and \$4 for children. A total of 600 tickets were sold for \$3040. How many adult tickets were sold and how many child tickets were sold?

$x$  = number of adult tickets  
 $y$  = number of children tickets

$$\begin{aligned} 9x + 4y &= 3040 \\ x + y &= 600 \end{aligned}$$

$$x = 600 - y$$

$$\begin{aligned} x &= 600 - 472 \\ x &= 128 \end{aligned}$$

$$9(600 - y) + 4y = 3040$$

$$5400 - 9y + 4y = 3040$$

$$5400 - 5y = 3040$$

$$\begin{aligned} -5y &= -2360 \\ -5 & \quad -5 \end{aligned}$$

$$y = 472$$

number of adult tickets: 128      number of child tickets: 472

(96). At Preston's Burger Palace, the Galvin family has 6 burger platters and 4 colas for \$62. The Bateman family has 5 burger platters and 2 colas for \$49. Find the price of one burger platter and the price of one cola.

$x$  = price of burger platter  
 $y$  = price of cola

$$\begin{aligned} 6x + 4y &= 62 \\ -2(5x + 2y &= 49) \quad + \quad -10x - 4y = -98 \\ \hline -4x &= -36 \\ -4 & \quad -4 \\ \hline x &= 9 \end{aligned}$$

$$\begin{aligned} 6(9) + 4y &= 62 \\ 54 + 4y &= 62 \\ \hline 4y &= 8 \\ \frac{4y}{4} & \quad \frac{8}{4} \\ y &= 2 \end{aligned}$$

price of one burger platter: \$9.00      price of one cola: \$2.00

(97). Midas has a collection of coins, all dimes and quarters, worth \$10. He has 16 more dimes than quarters. How many of each type of coin does he have?

$d$  = number of dimes  
 $q$  = number of quarters

$$\begin{aligned} d &= q + 16 \\ 0.10d + 0.25q &= 10.00 \\ 0.10(q + 16) + 0.25q &= 10.00 \\ 0.10q + 1.60 + 0.25q &= 10.00 \\ 0.35q &= 8.40 \\ \frac{0.35q}{.35} & \quad \frac{8.40}{.35} \\ q &= 24 \end{aligned}$$

$$\begin{aligned} d &= 24 + 16 \\ d &= 40 \end{aligned}$$

number of dimes: 40      number of quarters: 24