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**PLANT CITY HIGH SCHOOL**  
**ALGEBRA II**

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ANSWERS:

- |       |       |
|-------|-------|
| 1. C  | 16. B |
| 2. D  | 17. A |
| 3. C  | 18. A |
| 4. C  | 19. A |
| 5. C  | 20. C |
| 6. D  | 21. B |
| 7. E  | 22. A |
| 8. C  | 23. D |
| 9. D  | 24. C |
| 10. C | 25. A |
| 11. C | 26. A |
| 12. C | 27. C |
| 13. A | 28. A |
| 14. C | 29. B |
| 15. B | 30. D |

# Algebra II Ind.

$$1) \text{C} \log_7 72 = \log_7 8 \cdot 9 = \log_7 8 + \log_7 9 = \log_7 2^3 + \log_7 3^2 = 3 \log_7 2 + 2 \log_7 3 = 3x + 2y$$

$$2) \text{D} 90 - (180 - x) = 50 \\ -90 + x = 50 \\ x = 140$$

$$3) \text{C} \frac{1}{a} + \frac{1}{b} = \frac{a+b}{ab} \\ \text{Sum} = \frac{B}{A} = \frac{3}{2} \\ \text{Product} = \frac{C}{A} = \frac{5}{2} \\ \frac{\frac{3}{2}}{\frac{5}{2}} = \frac{3}{5}$$

$$4) \text{C} \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{6} + \frac{1}{8} + \frac{1}{12} + \dots \\ \frac{1}{2} + \frac{1}{4} + \frac{1}{8} \dots + \frac{1}{3} + \frac{1}{6} + \frac{1}{12} \dots \\ \frac{\frac{1}{2}}{1 - \frac{1}{2}} = 1 \quad \frac{\frac{1}{3}}{1 - \frac{1}{3}} = \frac{2}{3} \\ 1 + \frac{2}{3} = \frac{5}{3}$$

$$5) \text{C} y^2 - (5x+8)y + (6x^2+19x+15) = 0$$

Quadratic Formula

$$y = \frac{(5x+8) \pm \sqrt{(5x+8)^2 - 4(6x^2+19x+15)}}{2}$$

$$y = \frac{5x+8 \pm \sqrt{x^2+4x+4}}{2}$$

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

$$y = 3x+5 \text{ and } y = 2x+3$$

Two Lines

Plant City Inv. 1974

$$6) \text{D} .7x + .5(10) = .65(x+10) \\ .05x = 1.5 \\ x = 30$$

$$7) \text{E} 2^x + 2^x + 2^x + 2^x = 1024 \\ 2^x(4) = 1024 \\ 2^x = 256 \\ x = 8$$

$$8) \text{C} \text{ Everything after 4! ends in zero.} \\ 0! + 1! + 2! + 3! + 4! = 1 + 1 + 2 + 6 + 24 = 34$$

$$9) \text{D} (\log_3 X)^2 + \log_3 X^3 - \log_2 16 = 0 \\ \text{let } \log_3 X = y \quad y^2 + 3y - 4 = 0 \\ (y+4)(y-1) = 0 \\ \log_3 X = -4 \quad \log_3 X = 1 \\ x = 1/81 \quad x = 3$$

$$10) \text{C} \text{ Remainder when divided by 10 is units digit}$$

$$3^{15} + 4^{30} + 5^{20} \\ \begin{matrix} 3^1 = 3 & 4^1 = 4 & 5^1 = 5 \\ 3^2 = 9 & 4^2 = 16 & 5^2 = 25 \\ 3^3 = 27 & 4^3 = 64 \\ 3^4 = 81 \end{matrix}$$

$$7 + 6 + 5 = 18$$

8

$$11) \text{C} \begin{array}{r} a \mid 60 - 22c \\ \underline{12 \quad 24 \quad 4} \\ 6 \quad 12 \quad 8 \quad 5 \end{array}$$

$$c + 4 = 5$$

$$c = 1$$

$$12) \text{C} y = x^2 - 4x + 9 \\ y - 9 + 4 = (x-2)^2 \\ y - 5 = (x-2)^2$$

Min. 5

$$13) \text{A} \quad a_n = a_1 + (n-1)d$$

$$150 = a_1 + 10d$$

$$80 = a_1 + 5d$$

$$a = 10$$

$$14) \text{C} \quad {}_9C_3 = \frac{9 \cdot 8 \cdot 7}{3 \cdot 2} = 84$$

$$15) \text{B} \quad \begin{array}{l} 4 - 2x < 7 \\ -2x < 3 \\ x > -\frac{3}{2} \end{array} \quad \begin{array}{l} 4 - 2x > -7 \\ -2x > -11 \\ x < \frac{11}{2} \end{array}$$

$$x = -1, 0, 1, 2, 3, 4, 5$$

$$\text{Sum} = 14$$

$$16) \text{B} \quad 243_5 = 133_x$$

$$3(5^0) + 4(5^1) + 2(5^2) =$$

$$3(x^0) + 3(x^1) + 1(x^2) =$$

$$x^2 + 3x - 70 = 0$$

$$(x-7)(x+10) = 0$$

$$x = 7, -10$$

$$17) \text{A} \quad \sqrt{3+2\sqrt{a}} = \sqrt{a} + \sqrt{b}$$

$$3+2\sqrt{a} = a+2\sqrt{ab}+b$$

$$a+b=3$$

$$2\sqrt{ab} = 2\sqrt{a}$$

$$a+b=3$$

$$ab=2$$

$$a=1 \quad b=2$$

$$1+\sqrt{2}$$

$$18) \text{A} \quad (3x+2y-3z)^3$$

$$(3(1)+2(1)-3(0))^3$$

$$5^3 = 125$$

$$19) \text{A} \quad x - \frac{1}{\frac{1-x}{1-x} - \frac{x}{1-x}} = x - \frac{1}{\frac{1-2x}{1-x}} =$$

$$x - \frac{1-x}{1-2x} = \frac{(1-2x)x - (1-x)}{1-2x} = \frac{-2x^2+2x-1}{-2x+1}$$

$$20) \text{C} \quad \frac{3x-1}{x^2+x-6} = \frac{A(x+3) + B(x-2)}{(x-2)(x+3)}$$

$$(A+B)x = 3$$

$$A+B=3$$

$$21) \text{B} \quad \frac{1}{x+\sqrt{x+y}} = \frac{x-\sqrt{x+y}}{(x+\sqrt{x+y})(x-\sqrt{x+y})}$$

$$\frac{x-\sqrt{x+y}}{x^2-x-y}$$

$$22) \text{A} \quad \begin{array}{l} y = 2x+4 \\ x = 2y+4 \\ y = \frac{x-4}{2} \end{array} \quad \begin{array}{l} f^{-1}(6) = \frac{6-4}{2} \\ = 1 \end{array}$$

23) D The absolute value of any Real number is always nonnegative Therefore  $\emptyset$

$$24) \text{C} \quad \begin{array}{r} \underline{1 \ 0 \ -5 \ 3 \ 1} \\ \underline{1 \ 1 \ -4 \ -1} \\ 1 \ 1 \ -4 \ -1 \ 0 \end{array}$$

$$x^3 + x^2 - 4x - 1$$

$$25) \text{A} \quad x^3 = 8 \quad \text{only real solution is } 2$$

$$x^3 - 8 = 0$$

$$\text{Sum} = 0$$

$$0 - 2 = -2$$

$$26) \text{A} \quad (x - x^{-1})^4$$

$${}^4C_3 (x)^3 (-x^{-1})^3$$

$$\frac{4 \cdot 5 \cdot 4}{3 \cdot 2} = 20 \cdot -1$$

$$-20$$

$$27) \text{C} \quad 5 = \sqrt{x-5}$$

$$25 = x-5$$

$$x = 30$$

$$28) \text{A} \quad \log_5 x + \log_5 (x+4) = 1$$

$$\log_5 x(x+4) = 1$$

$$x^2 + 4x = 5$$

$$x^2 + 4x - 5 = 0$$

$$(x-1)(x+5) = 0$$

$$x = 1, -5$$

$$29) \text{B} \quad |x+4| = 15 - 2x$$

$$x+4 = 5-2x$$

$$x = 1/3$$

$$x+4 = 2x-5$$

$$x = 9$$

$$-x-4 = 5-2x$$

$$x = 9$$

$$-x-4 = 2x-5$$

$$x = 1/3$$

$$x = 1/3, 9$$

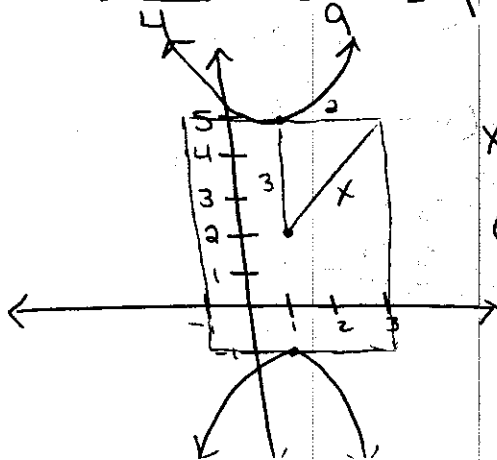
$$30) \text{D} \quad 9x^2 - 4y^2 - 18x + 16y + 29 = 0$$

$$9(x^2 - 2x) - 4(y^2 - 4y) = -29$$

$$9(x-1)^2 - 4(y-2)^2 = -29 + 4(4) + 9$$

$$9(x-1)^2 - 4(y-2)^2 = -36$$

$$\frac{-(x-1)^2}{4} + \frac{(y-2)^2}{9} = 1$$



$$x = \sqrt{13}$$

$$(1, 2 \pm \sqrt{13})$$

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Foci