

ALGEBRA ONE INDIVIDUAL ROUND  
200  
FEBRUARY REGIONAL COMPETITION

ANSWER SHEET

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

INDIVIDUAL SOLUTIONS ALG. ONE FEB REGIONAL

1.  $5(-3) = -(-3)^4 - (-3)^3 + 3(-3) + 18$   
 $= -81 - 9 - 9 + 18$   
 $= -81$  (A)

2.  $3x-7 = 8$  or  $3x-7 = -8$   
 $3x = 15$  or  $3x = -1$   
 $x = 5$  or  $x = -\frac{1}{3}$   
 $5 + -\frac{1}{3} = 4\frac{2}{3}$  (C)

3.  $4x + 3y = 7$   
 $3x - 4y = 5$   
 At (5, -9)  
 $3(5) - 4(-9) = 15 + 36 = 51$   
 $3x - 4y = 51$   
 $(15, 0)$   
 $3x = 51$   
 $x = 17$  (D)

4.  $(2x^3 - y^4)(y^{-2} x^4 y^{-8})$   
 $\frac{2x^3 y^4 \cdot 8}{16x^3 y^4} = \frac{x}{y}$  (D)

5.  $L = 125$   
 $S = 125(6/16) = 20$   
 $(4217)(125) + (125)(160)$   
 $527125 + 50220$   
 $577345 \rightarrow$  SHIELDS (B)

6.  $y = -1$   
 $\begin{cases} x-1+z=4 \\ x+2-z=1 \end{cases}$   
 $x+z=5$   
 $x-z=4$   
 $2z=1$   
 $z=0.5$   
 $x=4.5$   
 $x=2$

7.  $\sqrt{m^2} = |m|$  (A)

8.  $\frac{x+1}{x} = \frac{2}{3}$   
 $3(x+1) = 2x$   
 $3x+3 = 2x$   
 $x = -3$

9. MINDMATTER  
 $(\frac{3+10}{2}, \frac{6+2}{2})$   
 $(\frac{13}{2}, 4)$  (A, 5)

10.  $K = \pm 9, \pm 6$   
 $when = 0$  (A)

11.  $x+3\sqrt{x^2+2x+9}$   
 $\frac{x^2-3x+9}{x^2+3x}$   
 $\frac{-3x^3+9x}{-3x^2-9x}$   
 $\frac{3x^2-3}{9x+27}$  (E)

12.  $\frac{II}{I} + \frac{II}{L} + \frac{II}{R} = 1$   
 $\frac{x}{7} + \frac{x}{12} + \frac{x}{13} = 1$   
 $\frac{17x}{84} = 1$   
 $17x = 84$   
 $x = \frac{84}{17}$  (D)

13.  $x^2 + 2$   
 $\frac{5x-3}{5x^2-3x^2+2x+2}$   
 $\frac{-3x^2-10x+2}{(x^2-3x^2+2x+2)}$   
 $\frac{-3x^2-10x+2}{-3x^2}$   
 $\frac{1}{3} + \frac{-(-10x+2)}{-3} = \frac{4-E^2}{3}$   
 $\frac{E(-E^2-25) - (-E-2)(E+2)}{(E+5)(E-5)}$   
 $\frac{E^3-25E - E^2-3E+10+4-E^2}{E^2-25}$   
 $\frac{E^3-2E^2-28E+14}{E^2-25}$  (A)

15.  $5(9x) = 2(x-5)^2 + 3$   
 $= 2(x^2 - 10x + 25) + 3$   
 $= 2x^2 - 20x + 53$   
 $2 - 20 + 53 = 35$  (B)

16.  $x = (2^3 - 3^3)^{\frac{1}{2}}$   
 $x = (8 - 27)^{\frac{1}{2}}$   
 $x = (-19)^{\frac{1}{2}}$   
 $x = \pm \sqrt{-19}$   
 $x = \pm 1.71(1.17i) = 1.71(0.829)$   
 $z = -1.71759$  (D)

17. PERSON

PERSON	Rate	Time	Distance
ROBERT	5x	x + 1/4	3(x + 1/4)
SON	x	x	5x

18.  $3x - 4y = -12$   
 $x - 2y = -3$   
 $x = 0$   
 $-4y = -12$   
 $y = 3$   
 $(0, 3)$   
 $C^2 = 3^2 + 4^2 = 9 + 16 = 25$   
 $C = 5$  (A)

19.  $3x + \frac{3}{4} = 5x$   
 $\frac{3}{4} = 2x$   
 $x = \frac{3}{8}$  HOURS  
 $x \cdot 3 = 22.5$  min (B)

20.  $(5-2)(4-1)$   
 $3 \cdot 3 = 9$   
 $3x^2 + 6x - 15 = 0$   
 $x = \frac{-6 \pm \sqrt{36 - 4(-15)}}{2}$   
 $x = \frac{-6 \pm \sqrt{90}}{2} = \frac{-6 \pm 3\sqrt{10}}{2}$   
 $x = -1 \pm \sqrt{10}$  (D)

21.  $3x^2 + 6x - 15 = 0$   
 $x = \frac{-6 \pm \sqrt{36 - 4(-15)}}{2}$   
 $x = \frac{-6 \pm \sqrt{90}}{2} = \frac{-6 \pm 3\sqrt{10}}{2}$   
 $x = -1 \pm \sqrt{10}$  (D)

22.  $(12)^2 + 2(12)(14) + (12)^2$

23. TYPE <sup>9x17</sup> Amount DISTANCE

100	X	100X
22	22	22-22
34	X+22	34(X+22)
100X + 484 = 34X + 748		

25.  $45 + 50 = 95$  mph  
 $D = RT$   $\text{time} = \frac{2}{60}$  hr  
 $D = \frac{1}{30} \cdot 95 = \frac{95}{30} = \frac{19}{6}$   
 $D = 3\frac{1}{6}$  mi

24.  $-1 > |-2|$   $66x = 264$   $x = 4$  (B)  
 $-2 < -1$  Absolute value  
 $|z| < -1$  never true  
 No solution (E)

26.  $2x + 3x^2 - 2$   
 $(2x^2 - 1)(x^2 + 2)$  (D)  
 27.  $-3[4x - 6(x-3)] - 5[-7x - 2(3+2)]$   
 $-3(4x - 6x + 18) - 5(-7x - 6 - 4x)$   
 $-12x + 18x - 54 + 35x + 30 + 20x$   
 $61x - 24$  (A)

28. INVESTMENT PRINCIPLE RATE INTEREST

X%	1100	.01X	.01X (1100)
X+1.5%	1800	.01X + .015	(.01X + .015) 1800
$.01x(1100) + (.01x + .015) 1800 = 288$			
$11x + 18x + 27 = 288$			
$29x = 261$			
$x = 9$			
$x + 1.5 = 10.5$			
19.5% (B)			

29. TYPE NUMBER AMOUNT \$310 = 310 pounds

P	X	$\frac{1}{2}X$	10
N	2X	5(2X)	20
D	50-3X	10(50-3X)	20-20
$x + 10x + 500 - 30x = 310$			
$-19x = -190$			
$x = 10$			
(A) 0			

30.  $\frac{8-4(8-3)+12 \div 4-3}{-1-6+2}$   
 $\frac{8-4(5)+3-3}{-1-4}$   
 $\frac{8-20}{-4} = \frac{-12}{-4} = 3$  (C)