Name: _Answer Key_

1. Factor: (Do NOT use factor theorem)

a) $18x^2 - 37xy - 20y^2$ $\begin{array}{c}9+4\\2-5\end{array}$
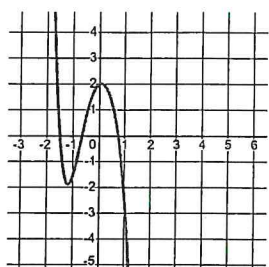
[4] $= (9x + 4y)(2x - 5y)$

b) $x^2 - y^2 + z^2 - 2xz$

$= x^2 - 2xz + z^2 - y^2$

$= (x - z)^2 - y^2$

$= (x - z + y)(x - z - y)$

2. Given the graph below, which statement is true about the polynomial? ___D___

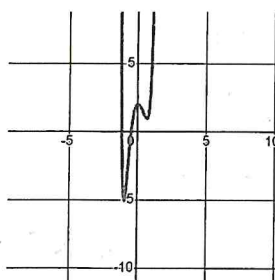**[2]**

A. positive leading coefficient, even degree
B. negative leading coefficient, even degree
C. positive leading coefficient, odd degree
D. negative leading coefficient, odd degree
E. none of the above

3. Given the graph below, which statement is true about the polynomial? ___B___

[2]

A. degree of the polynomial could be 2
B. degree of the polynomial could be 4
C. degree of the polynomial could be 3
D. degree of the polynomial could be any degree that is 5 or more
E. none of the above

4. Divide: $\left(18x^3 - 55x^2 + 37x - 7\right) \div (2x - 5)$

[3]

$$
\begin{array}{r}
9x^2 - 5x + 6 \\
2x - 5 \overline{)\,18x^3 - 55x^2 + 37x - 7} \\
18x^3 - 45x^2 \\
\hline
-10x^2 + 37x \\
-10x^2 + 25x \\
\hline
12x - 7 \\
12x - 30 \\
\hline
23
\end{array}
$$

5. Use remainder theorem to determine the remainder when $f(x) = 4x^3 - x^2 + 5x - 3$ is divided by $(2x - 5)$.

$$f\left(\tfrac{5}{2}\right) = 4\left(\tfrac{125}{8}\right) - \left(\tfrac{25}{4}\right) + \tfrac{25}{2} - 3$$

[2]

$$= \frac{250 - 25 + 50 - 12}{4}$$

$$= \frac{263}{4}$$

6. Solve:

a) $x^2 + y^2 = 100$ ①
   $x - y = 2$ ②

② $x = y + 2$ sub ② in ①

$(y+2)^2 + y^2 = 100$

$y^2 + 4y + 4 + y^2 = 100$

$2y^2 + 4y - 96 = 0$

$y^2 + 2y - 48 = 0$

$(y+8)(y-6) = 0$

∴ $y = -8$ or 6

sub $y = -8$ in ②   sub $y = 6$ in ②

$x + 8 = 2$ $x - 6 = 2$

$x = -6$ $x = 8$

∴ $(-6, -8)$ ∴ $(8, 6)$

b) $\sqrt{4x^2 + 9} - 3 = x$

$\sqrt{4x^2 + 9} = x + 3$

$4x^2 + 9 = x^2 + 6x + 9$

$3x^2 - 6x = 0$

$3x(x - 2) = 0$

∴ $x = 0$ or 2

sub $x = 0$ sub $x = 2$

$LS = 0$ $RS = 0$ $LS = 5 - 3$ $RS = 2$
                                    $= 2$