1. First factor the middle term of the expression: $(x^2 + 8x + 16) = (x + 4)^2$. Now we have $x(x + 4)^2(4 - x) = 0$. The roots are EVERY value of x such that the equation equals zero. The equation is a fourth degree polynomial (meaning the highest exponent is 4), so there must be 4 roots total. So we split up the equation into its parts and determine that $x = 0, x = -4, -4$ (yes, twice! otherwise we will not have 4 roots total), and $x = 4$. $\boxed{\text{D}}$

2. $\boxed{\text{D}}$

3. $\boxed{\text{E}}$

4. $\boxed{\text{E}}$

5. $\boxed{\text{A}}$

6. The equation $y = x^2$ is a parabola. If we have a straight line on the same plane, it can intersect the parabola twice, once, or never. So if the pair of equations has two identical solutions (or one solution), then they intersect only once. Set the equations equal to each other and solve for k: $x^2 = 3x + k \Rightarrow x^2 - 3x - k = 0$. Use the quadratic equation: $x = \dfrac{3 \pm \sqrt{9 - 4(-k)}}{2}$. For x to have only one solution, there cannot be the plus/minus part, which will give us 2 solutions. So we must find k such that $\sqrt{9 + 4k} = 0$. Solve: $9 + 4k = 0 \Rightarrow k = -\frac{9}{4}$. $\boxed{\text{D}}$

7. First let's consider a difference of cubes: $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$. Since $a - b = x$ and $a^3 - b^3 = 19x^3$, then $a^2 + ab + b^2 = 19x^2$. Now since $a - b = x$, then $b = a - x$, so substitute this into the expression: $a^2 + a(a - x) + (a - x)^2 = a^2 + a^2 - ax + a^2 - 2ax + x^2 = 3a^2 - 3ax + x^2 = 19x^2$. Now subtract x^2: $3a^2 - 3ax = 18x^2 \Rightarrow a^2 - ax = 6x^2 \Rightarrow 6x^2 + ax - a^2 = 0$. Use the quadratic equation: $x = \dfrac{-a \pm \sqrt{a^2 - 4(6)(-a^2)}}{12} = \dfrac{-a \pm \sqrt{a^2 + 24a^2}}{12} = \dfrac{-a \pm \sqrt{25a^2}}{12} = \dfrac{-a \pm 5a}{12}$. So then we can conclude that since $x = \dfrac{-a + 5a}{12} = \dfrac{4a}{12} = \dfrac{a}{3}$, then $3x = a$, and since $x = \dfrac{-a - 5a}{12} = \dfrac{-6a}{12} = -\dfrac{a}{2}$, then $-2x = a$. $\boxed{\text{B}}$

8. $\boxed{\text{A}}$

9. $\boxed{\text{B}}$

10. $\boxed{\text{C}}$