

Name

Answers

Date

12.7 - Completing the Square

Factor into a square of binomials.

$$1) \quad y^2 + 6y + 9 = (y+3)^2$$

$$2) \quad x^2 - 4x + 4 = (x-2)^2$$

$$3) \quad p^2 - 14p + 49 = (p-7)^2$$

$$4) \quad a^2 + 16a + 64 = (a+8)^2$$

$$5) \quad x^6 + 10x^3 + 25 = (x^3+5)^2$$

$$6) \quad a^4 + 2a^2b^2 + b^4 = (a^2+b^2)^2$$

Complete the square. Then factor.

$$7) \quad x^2 + 14x + \underline{49} = (x+7)^2$$

$$8) \quad z^2 + 18z + \underline{81} = (z+9)^2$$

$$9) \quad k^2 - 12k + \underline{36} = (k-6)^2$$

$$10) \quad a^2 - 20a + \underline{100} = (a-10)^2$$

With the given equations: (a) move the constant to the right hand side, (b) complete the square, (c) balance the equation, and then (d) factor.

$$11) \quad x^2 - 4x - 17 = 0$$

$$x^2 - 4x + 4 = 17 + 4$$

$$(x-2)^2 = 21$$

$$12) \quad y^2 + 8y - 10 = 0$$

$$y^2 + 8y + 16 = 10 + 16$$

$$(y+4)^2 = 26$$

$$13) \quad c^2 + 18c - 175 = 0$$

$$c^2 + 18c + 81 = 175 + 81$$

$$(c+9)^2 = 256$$

$$14) \quad v^2 - 20v + 19 = 0$$

$$v^2 - 20v + 100 = 19 + 100$$

$$(v-10)^2 = 81$$

$$15) \quad z^2 - 6z - 307 = 8$$

$$z^2 - 6z + 9 = 315 + 9$$

$$(z-3)^2 = 324$$

$$16) \quad y^2 + 18y + 32 = 226$$

$$y^2 + 18y + 81 = 194 + 81$$

$$(y+9)^2 = 275$$

$$17) \quad x^2 - 12x + 35 = 0$$

$$x^2 - 12x + 36 = -35 + 36$$

$$(x-6)^2 = 1$$

$$18) \quad m^2 - 2m - 35 = 0$$

$$m^2 - 2m + 1 = 35 + 1$$

$$(m-1)^2 = 36$$

With the given equations: (a) organize the like terms (b) move the constant to the right hand side, (c) complete the square, (d) balance the equation, and then (e) factor.

$$19) \quad x^2 + y^2 - 2x + 6y + 3 = 0$$

$$x^2 - 2x + 1 + y^2 + 6y + 9 = -3 + 1 + 9$$

$$(x-1)^2 + (y+3)^2 = 7$$

$$20) \quad x^2 + y^2 - 4x + 12y - 7 = 0$$

$$x^2 - 4x + 4 + y^2 + 12y + 36 = 7 + 4 + 36$$

$$(x-2)^2 + (y+6)^2 = 47$$

$$21) \quad x^2 + y^2 + 8x - 2 = 0$$

$$x^2 + 8x + 16 + y^2 = 2 + 16$$

$$(x+4)^2 + y^2 = 18$$

$$22) \quad x^2 + y^2 - 8x + 4y - 8 = 0$$

$$x^2 - 8x + 16 + y^2 + 4y + 4 = 8 + 16 + 4$$

$$(x-4)^2 + (y+2)^2 = 28$$

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