ЗАДАЦИ ЗА ДРУГИ ДОМАЋИ

Решити диференцијалне једначине:

(1) $y'' + y'^2 = 2e^{-y}$;

(2) $x^4 y'' + (xy' - y)^3 = 0$;

(3) $y''' = 2(y'' - 1)\cot x$;

(4) $yy'' - 3y'^2 + 3yy' - y^2 = 0$;

(5) $x^3 y'' = (y - xy')(y - xy' - x)$;

(6) $2yy'' - 3y'^2 - 4y^2 = 0$;

(7) $x = \dfrac{y''}{\sqrt{1 + y''^2}}$;

(8) $3x^2 y''^2 - 2(3xy' + y)y'' + 4y'^2 = 0$;

(9) $(1 + y^2)yy'' = (3y^2 - 1)y'^2$;

(10) $y'' + 2y' = e^x y'^2$;

(11) $2yy'' + y'^2 + y'^4 = 0$;

(12) $y'' = (2xy - \frac{5}{x})y' + 4y^2 - \frac{4y}{x^2}$;

(13) $y''' = \sqrt{1 - x^2}$;

(14) $2xy'y'' = y'^2 - 1$;

(15) $xyy'' - 2xy'^2 + (y + 1)y' = 0$;

(16) $y'' + \frac{y'}{x} + \frac{y}{x^2} = \frac{y'^2}{y}$;

(17) $(y' + 2y)y'' = y'^2$;

(18) $4x^2 y^3 y'' = x^2 - y^4$;

(19) $x - \sin y'' + 2y'' = 0$;

(20) $y''^3 + xy'' = 2y'$;

(21) $xyy'' - 2xy'^2 + ayy' = 0$;

(22) $yy'' = y'^2 + 15y^2 \sqrt{x}$;

(23) $2yy'' = y'^2 + y^2$;

(24) $x = e^{y''} + y''$;

(25) $(x^2 + 1)(y'^2 - yy'') = xyy'$;

(26) $x^4 y'' - x^3 y'^3 + 2x^2 yy' - (3xy^2 + 2x^3)y' + 2x^2 y + y^3 = 0$;

(27) $2y'(y'' + 2) = xy''^2$;

(28) $(y' + 2y)y'' = y'^2$;

(29) $x^4(y'^2 - 2yy'') = 4x^3 yy' + 1$;

(30) $y''^3 - 2y'' - x = 0$;

(31) $y''^2 = 4(y' - 1)$;

(32) $x^2 yy'' = (y - xy')^2$;

(33) $x^2(x + y)y'' - (xy' - y)^2 = 0$;

(34) $y''' y'^2 = y''^3$;

(35) $xy'' = y' \ln \frac{y'}{x}$;

(36) $\frac{y^2}{x^2} + y'^2 = 3xy'' + \frac{2yy'}{x}$;

(37) $yy''^2 = 1$;

(38) $y' = xy'' + y''^2$;

(39) $x^3 y'' + 2xyy' - x^2 y'^2 - y^2 = 0$;

(40) $xy'' = y' + x \sin \frac{y'}{x}$;

(41) $x^2(x + y)y'' - (xy' - y)^2 = 0$;

(42) $xyy'' - xy'^2 - yy' = 0$;

(43) $y'^2 - 2y'y''' + 1 = 0$;

(44) $xy'' = y' + x(y'^2 + x^2)$;

(45) $x(x + y)y'' + xy'^2 + (x - y)y' - y = 0$;

(46) $y(1 - \ln y)y'' + (1 + \ln y)y'^2 = 0$;

(47) $x^2(y'^2 - 2yy'') = y^2$;

(48) $xyy'' + (\frac{ax}{\sqrt{b^2 - x^2}} - x)y'^2 - yy' = 0$
$a, b \in \mathbb{R} \setminus \{0\}$;

(49) $ayy'' + by'^2 - \frac{yy'}{\sqrt{x^2 + c^2}} = 0$
$a, b, c \in \mathbb{R} \setminus \{0\}$.

Испитати да ли дате диференцијалне једначине имају сингуларних решења.