

КОНТРОЛЬНАЯ ТОЧКА С2 (МА1, тех, 2020)

Задача 1 (3 балла)

Исследуйте функции на непрерывность. Постройте схематически график.

$$1 \quad y = \frac{x^2 + 2x}{x + 2};$$

$$2 \quad y = \frac{2}{(x-1)^3};$$

$$3 \quad y = \frac{x^3 - 4x}{x};$$

$$4 \quad y = \operatorname{arctg} \frac{1}{5-x};$$

$$5 \quad y = \operatorname{arctg} \frac{1}{-x-8};$$

$$6 \quad y = \frac{5x^2 + 3}{x-4};$$

$$7 \quad y = \frac{x^2 - 4x}{x+3};$$

$$8 \quad y = \frac{x^3 + 1}{x+1};$$

$$9 \quad y = \frac{x^2 - 4x + 7}{x-1};$$

$$10 \quad y = \operatorname{arctg} \frac{1}{x-3};$$

$$11 \quad y = \frac{x-8}{x^2};$$

$$12 \quad y = \frac{x+2}{x(x-1)};$$

$$13 \quad y = \frac{x^2 + 3x}{x+3};$$

$$14 \quad y = \frac{x^2 - 1}{x+1};$$

$$15 \quad y = \operatorname{arctg} \frac{1}{x+4};$$

$$16 \quad y = \frac{x}{(x+1)^2};$$

$$17 \quad y = \frac{x+2}{x(x-1)};$$

$$18 \quad y = \frac{2}{(1-x)^3};$$

$$19 \quad y = \frac{x^2 + 5x}{x-5};$$

$$20 \quad y = \frac{x^2 - 1}{x+5};$$

$$21 \quad y = \frac{x^2 + 3x - 1}{x-1};$$

$$22 \quad y = \frac{5x^2 + 3}{x-4};$$

$$23 \quad y = \frac{7x+9}{x+2};$$

$$24 \quad y = \frac{x^2 - x^3}{x-1};$$

$$25 \quad y = \frac{5x^2 - 3x}{x};$$

$$26 \quad y = \frac{x^2 + x}{x+1};$$

$$27 \quad y = \frac{x^2 - 3x}{x+1};$$

$$28 \quad y = \frac{x-8}{x^2};$$

$$29 \quad y = \operatorname{arctg} \frac{1}{x-4};$$

$$30 \quad y = \frac{x^2 + 7}{x+1};$$

Задача 1 (2 балла)

Исследуйте функции на непрерывность. Постройте схематически график.

$$1 \quad y = \begin{cases} -x, & x \leq 1, \\ \frac{2}{x-1}, & x > 1. \end{cases}$$

$$12 \quad y = \begin{cases} e^{-x}, & x < 0, \\ x^2 + 1, & x \geq 0. \end{cases}$$

$$2 \quad y = \begin{cases} \frac{2}{x^2 - 2x + 1}, & x < 1, \\ 1 - 2x, & x \geq 1. \end{cases}$$

$$13 \quad y = \begin{cases} \frac{1}{x+1}, & x < -1, \\ x, & x \geq -1. \end{cases}$$

$$3 \quad y = \begin{cases} \frac{1}{5}(2x^2 + 5), & x \leq 1, \\ x - 3, & x > 1. \end{cases}$$

$$14 \quad y = \begin{cases} \sqrt{x+1}, & x \geq 0, \\ x - 1, & x < 0. \end{cases}$$

$$4 \quad y = \begin{cases} x^2 + 1, & x < 2, \\ 2 - x, & x \geq 2. \end{cases}$$

$$15 \quad y = \begin{cases} \frac{4}{x^2 - 2x + 1}, & x < 1, \\ 2x + 1, & x \geq 1. \end{cases}$$

$$5 \quad y = \begin{cases} x + 2, & x < 2, \\ x^2 - 1, & x \geq 2. \end{cases}$$

$$16 \quad y = \begin{cases} (x-1)^2, & x \leq 0, \\ \frac{1}{x}, & x > 0. \end{cases}$$

$$6 \quad y = \begin{cases} x^3 - 1, & x \leq 1, \\ x - 3, & x > 1. \end{cases}$$

$$17 \quad y = \begin{cases} x, & x \leq 1, \\ \frac{2}{x-1}, & x > 1. \end{cases}$$

$$7 \quad y = \begin{cases} x - 1, & x < 0, \\ x^2 + 5, & x \geq 0. \end{cases}$$

$$18 \quad y = \begin{cases} 1 - x, & x < 1, \\ \ln x, & x \geq 1. \end{cases}$$

$$8 \quad y = \begin{cases} e^{x-2}, & x \leq 1, \\ x^2, & x > 1. \end{cases}$$

$$19 \quad y = \begin{cases} \frac{1}{5}(2x^2 + 5), & x \leq 1, \\ 3 - x, & x > 1. \end{cases}$$

$$9 \quad y = \begin{cases} 1, & x \leq 3, \\ x^2 - 8, & x > 3. \end{cases}$$

$$20 \quad y = \begin{cases} 2x - 5, & x < 3, \\ x^2 - 7, & x \geq 3. \end{cases}$$

$$10 \quad y = \begin{cases} -\sqrt{1-x}, & x \leq 0, \\ 1, & x > 0. \end{cases}$$

$$21 \quad y = \begin{cases} 2 - x, & x < 2, \\ x^2 - 1, & x \geq 2. \end{cases}$$

$$11 \quad y = \begin{cases} 4 \cdot 3^x, & x < 0, \\ 2 + x, & x \geq 0. \end{cases}$$

$$\mathbf{22} \quad y = \begin{cases} \frac{1}{x-2}, & x < 2, \\ x-2, & x \geq 2. \end{cases}$$

$$\mathbf{23} \quad y = \begin{cases} 4\left(\frac{1}{3}\right)^x, & x > 0, \\ 2-x, & x \leq 0. \end{cases}$$

$$\mathbf{24} \quad y = \begin{cases} 3x+1, & x \leq 0, \\ \frac{1}{x}, & x > 0. \end{cases}$$

$$\mathbf{25} \quad y = \begin{cases} e^x, & x \leq 1, \\ \frac{1}{1-x}, & x > 1. \end{cases}$$

$$\mathbf{26} \quad y = \begin{cases} x^2, & x \leq 1, \\ \frac{2}{x-1}, & x > 1. \end{cases}$$

$$\mathbf{27} \quad y = \begin{cases} \sqrt{1-x}, & x \leq 1, \\ 2-2x, & x > 1. \end{cases}$$

$$\mathbf{28} \quad y = \begin{cases} e^{x+1}, & x \leq -1, \\ \frac{1}{x+2}, & x > -1. \end{cases}$$

$$\mathbf{29} \quad y = \begin{cases} 2^x, & x \leq 0, \\ \frac{1}{x}, & x > 0. \end{cases}$$

$$\mathbf{30} \quad y = \begin{cases} x^2-1, & x \leq 1, \\ \frac{1-x}{3}, & x > 1. \end{cases}$$