

$$= \pi r^2 h$$

$$\sqrt{r^2 + h^2} = 60$$

$$60 - h^2$$

$$2 = \frac{4}{h}$$

$$V = f(h) = \pi r h \frac{60 - h^2}{4}$$

$$f'(h) = \frac{\pi h^3}{4} + 15\pi h$$

$$f''(h) = \frac{3\pi h^2}{4} + 15\pi$$

$$f''(h) = 0 \Rightarrow \sqrt{15} V h = -2\sqrt{5}$$

$$\int \frac{dx}{\sqrt{x^2 + a^2}} = \ln|x + \sqrt{x^2 + a^2}| + C$$

$$\int \frac{\sqrt{x^2 + a^2}}{x} dx = \sqrt{x^2 + a^2} - a \ln|x + \sqrt{x^2 + a^2}| + C$$



$$\int x^2 \sqrt{x^2 + a^2} dx = \frac{x}{8} (2x^2 + a^2) \sqrt{x^2 + a^2} - \frac{a^2}{8} \ln|x + \sqrt{x^2 + a^2}| + C$$

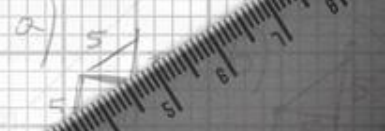
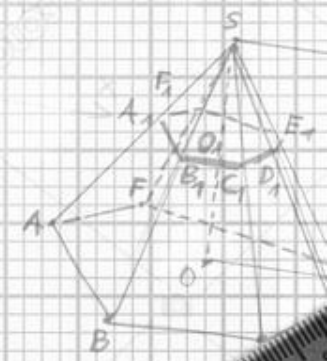
$$\int \frac{x^2}{\sqrt{x^2 + a^2}} dx = \frac{x}{2} \sqrt{x^2 + a^2} - \frac{a^2}{2} \ln|x + \sqrt{x^2 + a^2}| + C$$

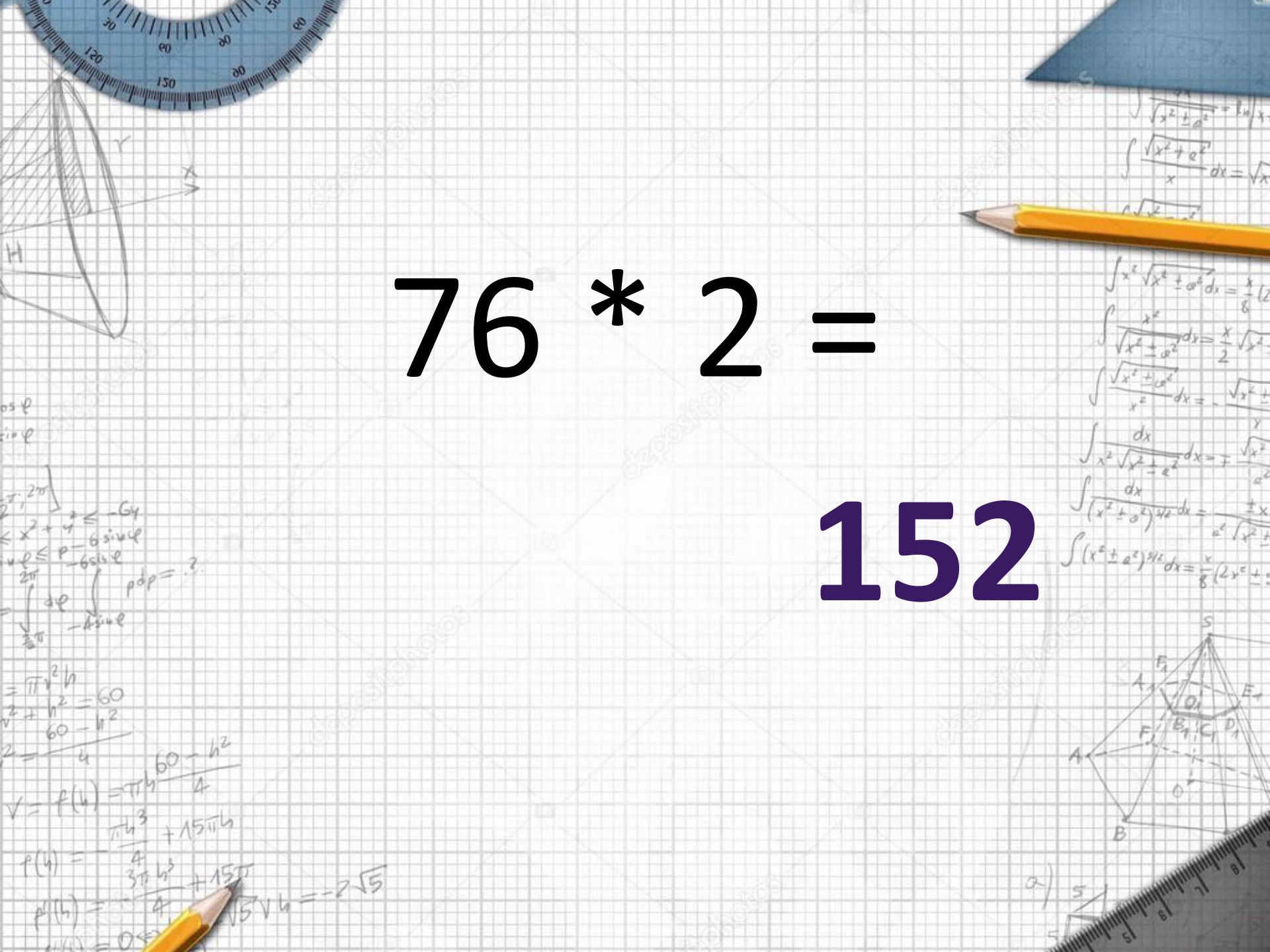
$$\int \frac{\sqrt{x^2 + a^2}}{x^2} dx = -\frac{\sqrt{x^2 + a^2}}{x} + \frac{a^2}{x^2} \ln|x + \sqrt{x^2 + a^2}| + C$$

$$\int \frac{dx}{x^2 \sqrt{x^2 + a^2}} = -\frac{1}{a^2} \frac{\sqrt{x^2 + a^2}}{x} + \frac{1}{a^2} \ln|x + \sqrt{x^2 + a^2}| + C$$

$$\int \frac{dx}{(x^2 + a^2)^{3/2}} = \frac{x}{a^2 \sqrt{x^2 + a^2}} + \frac{1}{a^2} \ln|x + \sqrt{x^2 + a^2}| + C$$

$$\int (x^2 + a^2)^{3/2} dx = \frac{x}{8} (2x^2 + a^2) \sqrt{x^2 + a^2} - \frac{a^2}{8} \ln|x + \sqrt{x^2 + a^2}| + C$$

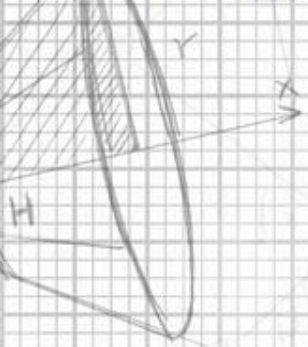



$$76 * 2 =$$

$$152$$

$$108 : 12 =$$

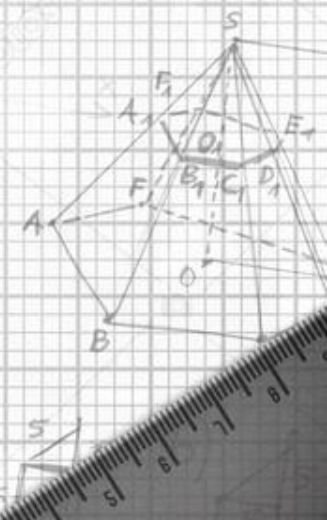
9



Handwritten notes on the left side of the page, including a diagram of a circle with radius  $r$  and angle  $\varphi$ . The notes include the equation  $x^2 + y^2 = -6x$  and other algebraic expressions.

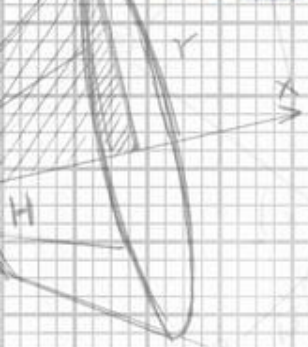
Handwritten calculations on the bottom left side of the page. It shows the volume of a cone  $V = \frac{1}{3}\pi r^2 h$  and a derivative calculation  $V'(h) = -2\sqrt{5}$ .

Handwritten mathematical formulas on the right side of the page, including integral formulas such as  $\int \frac{dx}{\sqrt{x^2 + a^2}} = \ln|x + \sqrt{x^2 + a^2}| + C$  and  $\int \frac{x^2}{\sqrt{x^2 + a^2}} dx = \frac{x}{2}\sqrt{x^2 + a^2} - \frac{a^2}{2}\ln|x + \sqrt{x^2 + a^2}| + C$ .



$$(74 - 55) * 4 =$$

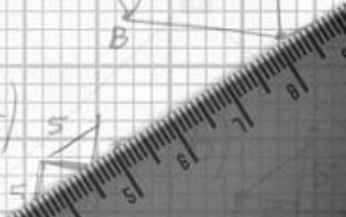
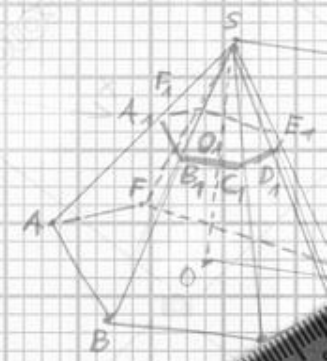
76



Handwritten notes on the left side of the grid, including a diagram of a circle with radius  $r$  and angle  $\varphi$ , and the equation  $x^2 + y^2 = -6x$ . Other notes include  $\rho \sin \varphi = -6$  and  $\rho \cos \varphi = ?$ .

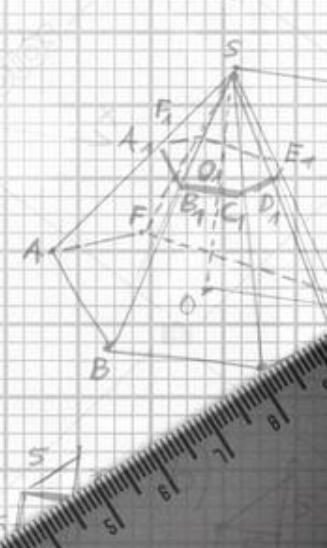
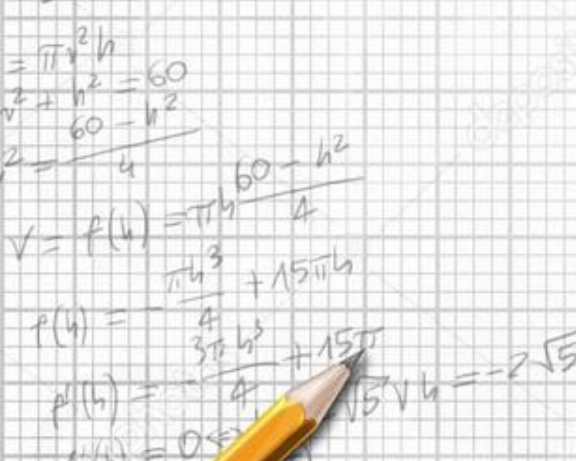
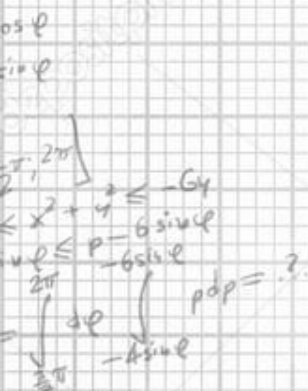
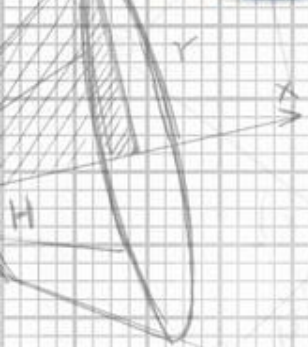
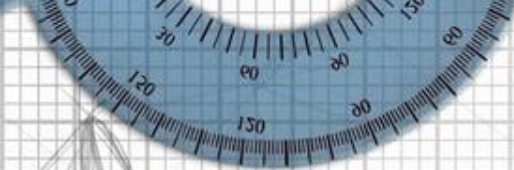
Handwritten calculations on the bottom left of the grid. It shows the volume of a cone  $V = \frac{1}{3}\pi r^2 h$  and a series of algebraic steps to solve for  $h$  given  $r^2 + h^2 = 60$ . The final result is  $h = 2\sqrt{5}$ .

Handwritten mathematical formulas on the right side of the grid, including  $\int \frac{1}{\sqrt{x^2 + a^2}} dx = \ln|x + \sqrt{x^2 + a^2}| + C$ ,  $\int \frac{x^2}{\sqrt{x^2 + a^2}} dx = \frac{x}{2}\sqrt{x^2 + a^2} - \frac{a^2}{2}\ln|x + \sqrt{x^2 + a^2}| + C$ , and  $\int \frac{dx}{(x^2 + a^2)^{3/2}} dx = \frac{x}{a^2\sqrt{x^2 + a^2}} + \frac{1}{a^3}\ln|x + \sqrt{x^2 + a^2}| + C$ .



$$(35 + 50) : 17 =$$

5



$$(88 : 4) * 5 =$$

$$110$$

$$(13 * 6) + 28 =$$

106

Расшифруйте слово, выполнив  
вычисления:

24004 : 4	72009 : 9	3507: 7	40040 : 5	12024 : 6	5656: 8
Р	М	И	Е	Н	З



501 – И

707 – З

8001 – М

8008 – Е

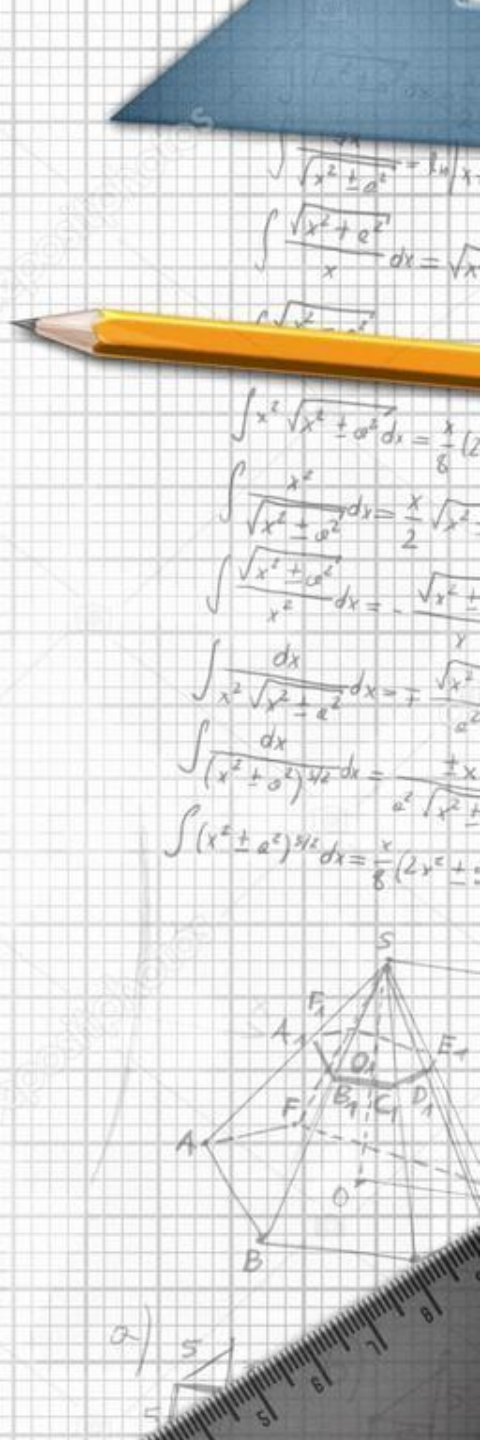
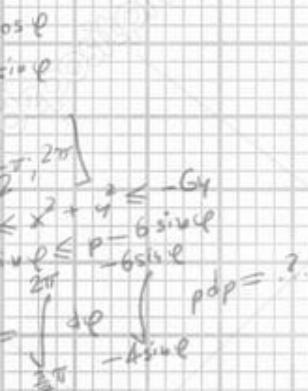
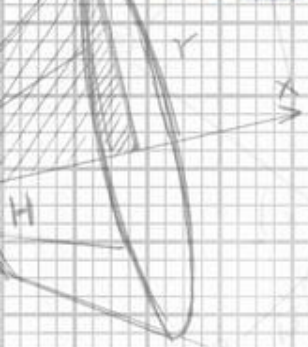
6001 – Р

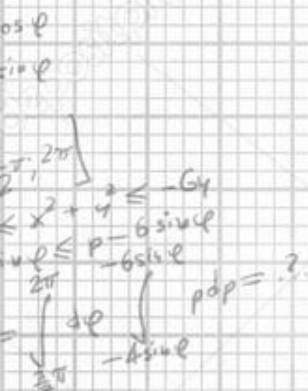
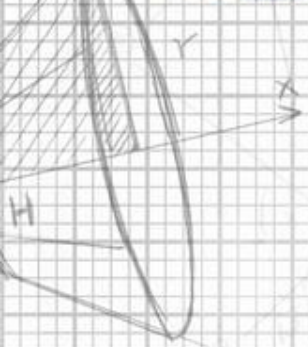
8008 – Е

2004 – Н

501 – И

8008 – Е





$$= \pi r^2 h$$

$$\sqrt{r^2 + h^2} = 60$$

$$60 - h^2$$

$$2 = \frac{\quad}{4}$$

$$V = f(h) = \pi r h \frac{60 - h^2}{4}$$

$$f'(h) = \frac{\pi h^3}{4} + 15\pi h$$

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$$\int \frac{\sqrt{x^2 + a^2}}{x} dx = \sqrt{x^2 + a^2} - a \ln \left| \frac{a + \sqrt{x^2 + a^2}}{x} \right| + C$$



$$\int x^2 \sqrt{x^2 + a^2} dx = \frac{x}{8} (2x^2 + a^2) \sqrt{x^2 + a^2} - \frac{a^2}{8} \ln \left| \frac{a + \sqrt{x^2 + a^2}}{x} \right| + C$$

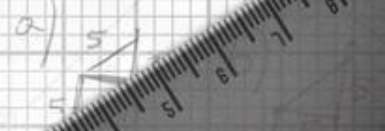
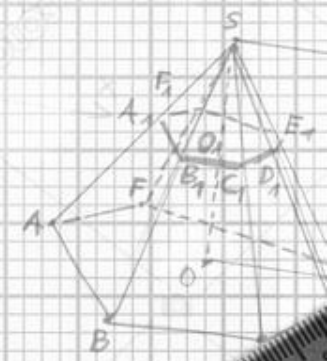
$$\int \frac{x^2}{\sqrt{x^2 + a^2}} dx = \frac{x}{2} \sqrt{x^2 + a^2} - \frac{a^2}{2} \ln \left| \frac{a + \sqrt{x^2 + a^2}}{x} \right| + C$$

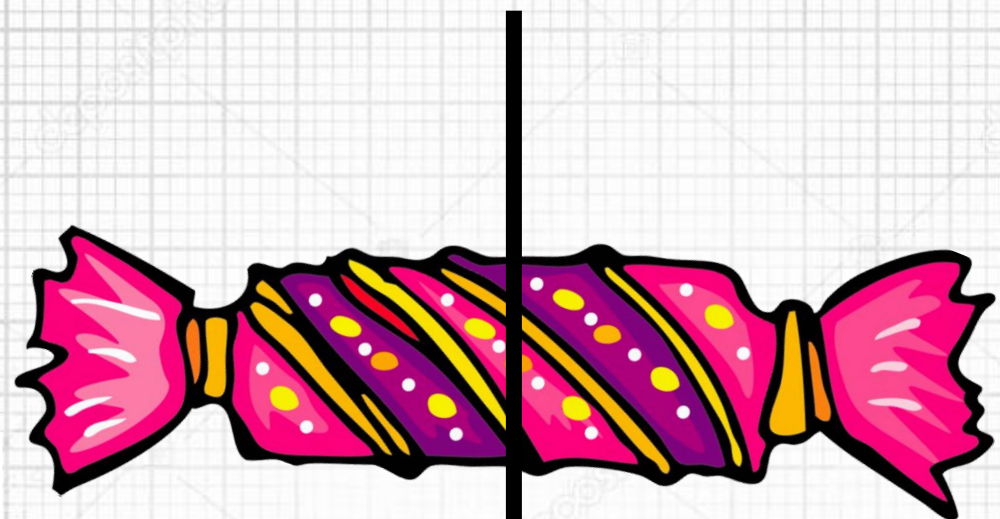
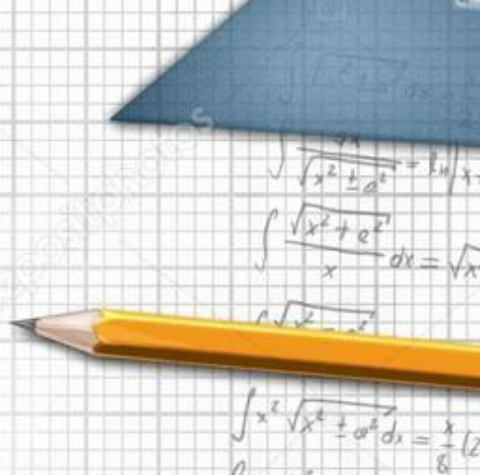
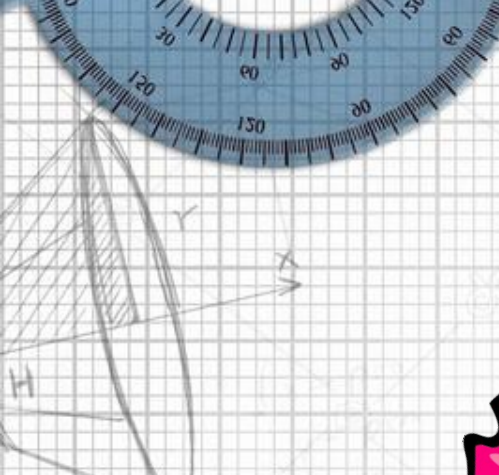
$$\int \frac{\sqrt{x^2 + a^2}}{x^2} dx = -\frac{\sqrt{x^2 + a^2}}{x} - \frac{a^2}{x} \ln \left| \frac{a + \sqrt{x^2 + a^2}}{x} \right| + C$$

$$\int \frac{dx}{x^2 \sqrt{x^2 + a^2}} = -\frac{1}{a^2} \frac{\sqrt{x^2 + a^2}}{x} - \frac{1}{a^2} \ln \left| \frac{a + \sqrt{x^2 + a^2}}{x} \right| + C$$

$$\int \frac{dx}{(x^2 + a^2)^{3/2}} = \frac{x}{a^2 \sqrt{x^2 + a^2}} + \frac{1}{a^2} \ln \left| \frac{a + \sqrt{x^2 + a^2}}{x} \right| + C$$

$$\int (x^2 + a^2)^{3/2} dx = \frac{x}{8} (2x^2 + a^2) \sqrt{x^2 + a^2} - \frac{a^2}{8} \ln \left| \frac{a + \sqrt{x^2 + a^2}}{x} \right| + C$$

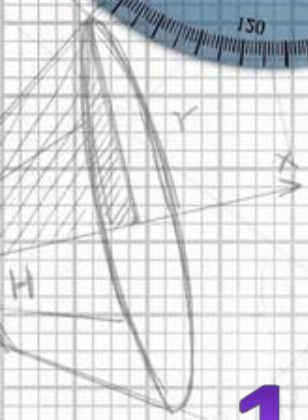




$\frac{1}{2}$

$\frac{1}{2}$





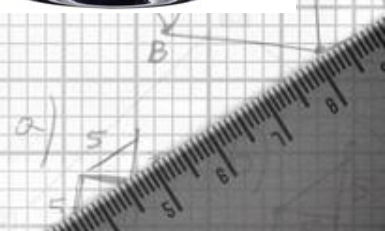
$\frac{1}{4}$

$\frac{1}{4}$



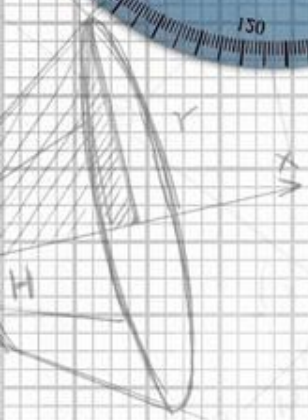
$\frac{1}{4}$

$\frac{1}{4}$



$$p(h) = \frac{\pi h^3}{4} + 15\sqrt{h}$$
$$p'(h) = \frac{3\pi h^2}{4} + 15\sqrt{h}$$
$$p'(h) = 0 \Rightarrow \sqrt{5} \sqrt{h} = -2\sqrt{5}$$

$$\int \frac{dx}{\sqrt{x^2+a^2}} = \ln|x + \sqrt{x^2+a^2}| + C$$
$$\int \frac{\sqrt{x^2+a^2}}{x} dx = \sqrt{x^2+a^2} - \frac{a^2}{x} + C$$
$$\int \frac{x^2}{\sqrt{x^2+a^2}} dx = \frac{x}{2} \sqrt{x^2+a^2} - \frac{a^2}{2} \ln|x + \sqrt{x^2+a^2}| + C$$
$$\int \frac{dx}{(x^2+a^2)^{3/2}} = \frac{x}{a^2 \sqrt{x^2+a^2}} + \frac{1}{a^2} \ln|x + \sqrt{x^2+a^2}| + C$$



$\cos \varphi$   
 $\sin \varphi$   
 $\frac{2\pi}{2\pi}$   
 $x^2 + y^2 \leq -Gx$   
 $\sqrt{x^2 + y^2} \leq -G \sin \varphi$   
 $\sqrt{x^2 + y^2} \leq -G \cos \varphi$   
 $\rho \cos \varphi = ?$

$= \pi r^2 h$   
 $\sqrt{z^2 + h^2} =$   
 $60 =$   
 $2 = \frac{h}{r}$   
 $v = f(h)$   
 $p(h) =$

**7/3**



$p'(h) = \frac{30\pi h + 120\pi}{4}$   
 $\sqrt{5} v h = -2\sqrt{5}$   
 $v(h) = 0$



**7 КГ**

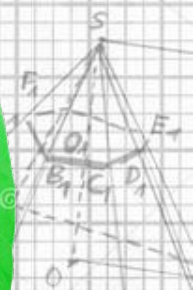
**7/3**



**7/3**

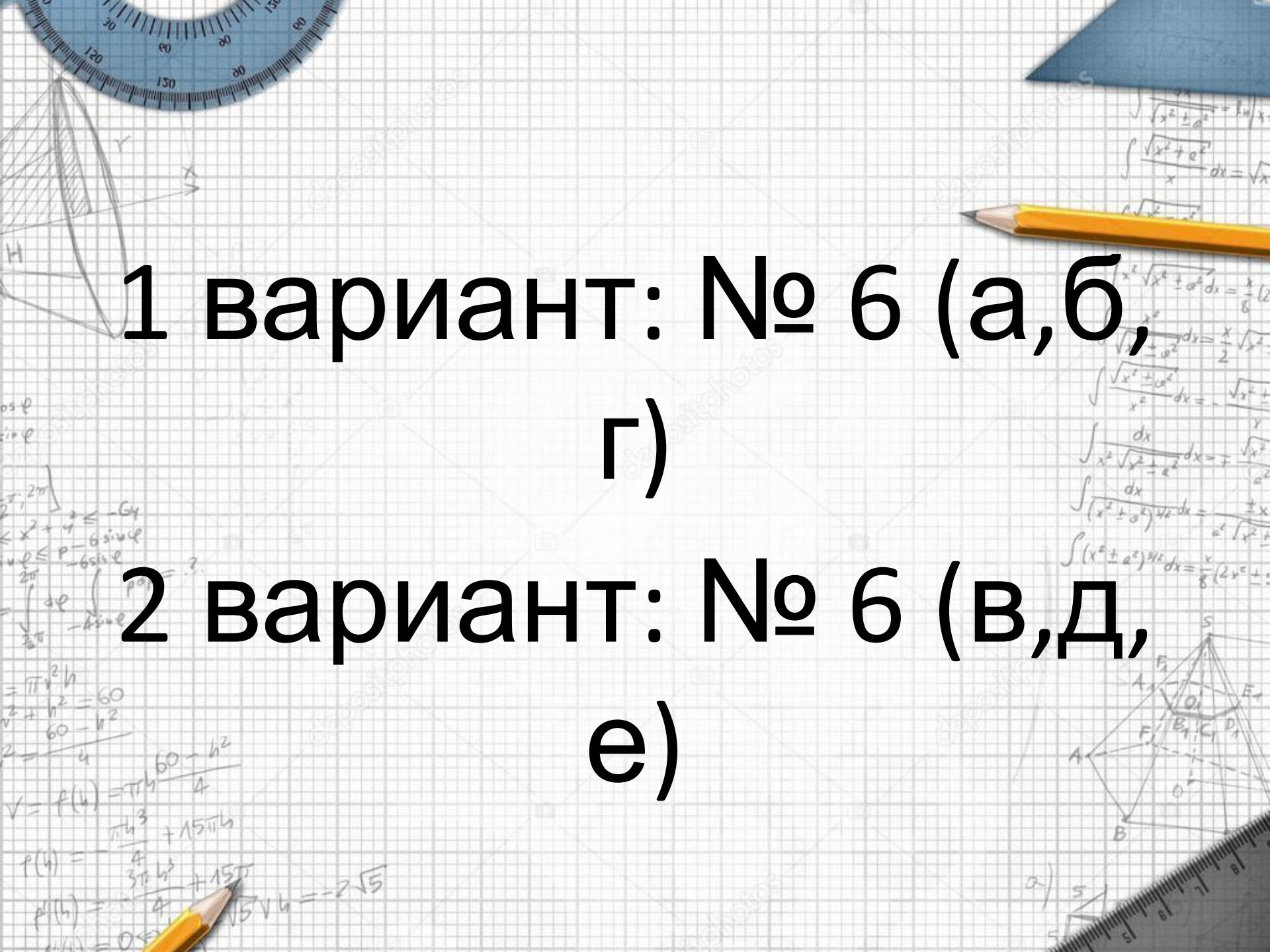


$\int \frac{dx}{x^2 \sqrt{x^2 + a^2}} = \frac{1}{a^2} \ln \left| \frac{x}{\sqrt{x^2 + a^2} + a} \right| + C$   
 $\int \frac{\sqrt{x^2 + a^2}}{x} dx = \sqrt{x^2 + a^2} + a \ln \left| \frac{x}{\sqrt{x^2 + a^2} + a} \right| + C$   
 $\int \frac{x^2}{\sqrt{x^2 + a^2}} dx = \frac{x}{2} \sqrt{x^2 + a^2} - \frac{a^2}{2} \ln \left| \frac{x}{\sqrt{x^2 + a^2} + a} \right| + C$   
 $\int \frac{dx}{(x^2 + a^2)^{3/2}} = \frac{x}{2a^2 \sqrt{x^2 + a^2}} + \frac{1}{2a} \arcsin \frac{x}{a} + C$   
 $\int \frac{dx}{(x^2 + a^2)^{5/2}} = \frac{x}{8a^4 \sqrt{x^2 + a^2}} + \frac{3x}{8a^3} \arcsin \frac{x}{a} + \frac{3}{8a} \arcsin \frac{x}{a} + C$



# Алгоритм нахождения $n$ -й доли единицы

1. Разделить целую единицу на  $n$  равных части.
2. Взять одну из равных частей



1 вариант: № 6 (а, б,  
г)

2 вариант: № 6 (в, д,  
е)