

$$11) \int \frac{x^2 - 9}{x^2 - 36} dx$$

$$x^2 - 36 \overline{) x^2 - 9} \\ - (x^2 - 36) \\ \hline \underline{\quad} 27$$

$$11) \quad x + \frac{9}{4} \ln \left( \frac{x-6}{x+6} \right) + C$$

$$\int 1 + \frac{27}{x^2 - 36}$$

$$\frac{27}{x^2 - 36} = \frac{A}{x+6} + \frac{B}{x-6}$$

$$27 = A(x-6) + B(x+6)$$

$$x=6;$$

$$\frac{27}{+12} = +12B$$

$$\frac{+9}{4} = B$$

$$\left. \begin{array}{l} x=-6; \\ 27 = -12A \\ A = -\frac{9}{4} \end{array} \right\}$$

$$\int \left( 1 - \frac{9}{4(x+6)} + \frac{9}{4(x-6)} \right) dx \\ = x - \frac{9}{4} \ln(x+6) + \frac{9}{4} \ln(x-6)$$

$$12) \int \frac{x^4}{x^2-9} dx$$

$$\begin{array}{r} x^2-9 \overline{) x^4 + 0x^3 + 0x^2 + 0x + 0} \\ \underline{-(x^4 - 9x^2)} \phantom{+ 0} \\ 9x^2 - 81 \phantom{+ 0} \\ \underline{-(9x^2 - 81)} \\ 81 \phantom{+ 0} \end{array}$$

$$\frac{81}{(x+3)(x-3)} = \frac{A}{x+3} + \frac{B}{x-3}$$

$$81 = A(x-3) + B(x+3)$$

$$\begin{array}{l} x=3: \quad 81 = 6B \\ \quad \quad B = \frac{81}{6} = \frac{27}{2} \end{array} \quad \left\{ \begin{array}{l} x=-3 \\ 81 = -6A \\ \quad \quad A = -\frac{27}{2} \end{array} \right.$$

$$\int \frac{u'}{u} = \ln|u| \quad -\frac{27}{2} \int \frac{1}{x+3} = \ln|x+3|$$

$$x^2 + 9 + \frac{81}{x^2-9} = x^2 + 9 - \frac{27}{2(x+3)} + \frac{27}{2(x-3)}$$

$$= \frac{1}{3}x^3 + 9x - \frac{27}{2} \ln(x+3) + \frac{27}{2} \ln(x-3)$$

$$= \frac{1}{3}x^3 + 9x + \frac{27}{2} \ln\left(\frac{x-3}{x+3}\right) + C$$

Solve the problem.

13) A car moving with an initial velocity of 3 mph accelerates at the rate of  $a(t) = 2.1t$  mph per second for 9 seconds. How fast is the car going when the 9 seconds are up?

13) \_\_\_\_\_

14) A car moving with an initial velocity of 9 mph accelerates at the rate of  $a(t) = 2.6t$  mph per second for 8 seconds. How far did the car travel during those 8 seconds?

14) \_\_\_\_\_

13

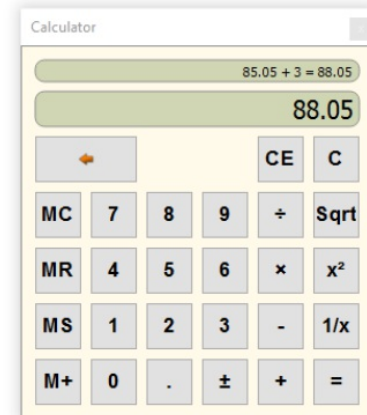
$$v(t) = \int_0^t a(t) dt + C \quad \swarrow 2.1t \quad v(t) = \int 2.1t$$

$$v(0) = \int_0^0 a(t) dt + C = 3$$

$$C = 3$$

$$v(t) = 1.05t^2 + 3$$
$$v(9) = 1.05(9)^2 + 3$$
$$= 88.05$$

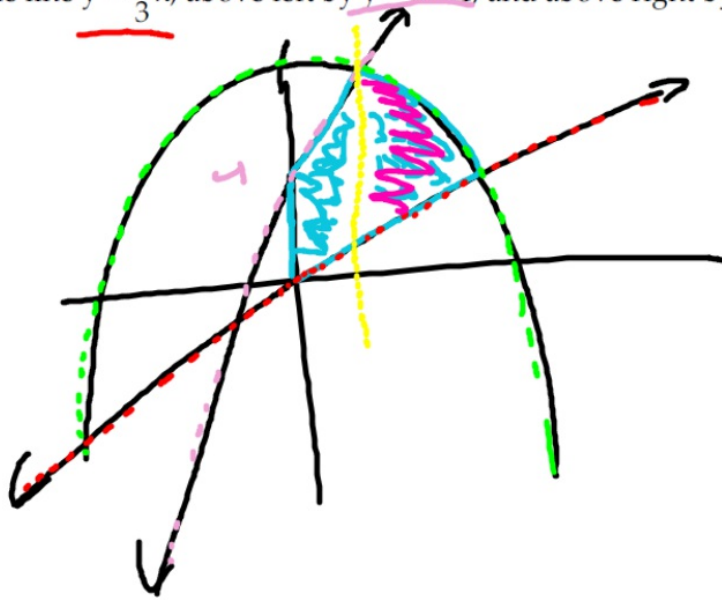
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#14!



Find the area enclosed by the given curves.

15) Find the area of the region in the first quadrant bounded on the left by the y-axis, below by 15) \_\_\_\_\_

the line  $y = \frac{1}{3}x$ , above left by  $y = x + 4$ , and above right by  $y = -x^2 + 10$ .



$$\int \left( (x+4) - \frac{1}{3}x \right) dx + \int \left( (-x^2+10) - \frac{1}{3}x \right) dx$$

;) .