

CALCULUS 2

CHAPTERS 5 & 6 PRACTICE TEST

Name: KE-1

Evaluate the following indefinite integrals:

$$1. \int 2x^{-3} + 6\sqrt{x} - 3x^{3/4} + \frac{2}{3}x^2 dx$$

$$-x^{-2} + 4\sqrt{x^3} - \frac{12}{5}x^{5/4} + \frac{2}{9}x^3 + C$$

$$3. \int 1 + \sin^2 x \csc x dx = \int 1 + \sin x dx$$

$$x - \cos x + C$$

$$5. \int \frac{2x}{\sqrt{4x^2+5}} dx \quad u=4x^2+5 \quad du=8x \quad \int \frac{1}{4} \cdot \frac{1}{\sqrt{u}} du$$

$$\frac{1}{2} \sqrt{4x^2+5} + C$$

$$2. \int \frac{x^5 + 2x^2 - 4}{2x^4} dx = \int \frac{1}{2}x + x^{-2} - 2x^{-4}$$

$$\frac{1}{4}x^2 - \frac{1}{x} + \frac{2}{3x^3} + C$$

$$4. \int (2x+7)(x^2+7x+3)^{4/5} dx \quad u=x^2+7x+3 \quad du=2x+7 \quad \int u^{4/5} du$$

$$\frac{5}{9} (x^2+7x+3)^{9/5} + C$$

$$6. \int \cos^3 2x \sin 2x dx \quad u = \cos 2x \quad du = -2\sin 2x \quad \int -\frac{1}{2} u^2 du$$

$$-\frac{1}{8} \cos^4 2x + C$$

Evaluate the following definite integrals:

$$7. \int_1^2 \frac{1}{x^3} - \frac{2}{x^2} + x^{-4} dx$$

$$-\frac{1}{2}x^{-2} + 2x^{-1} - \frac{1}{3}x^{-3} \Big|_1^2$$

$$8. \int_{-\pi/2}^{\pi/2} -3 \sin 2x dx$$

$$\frac{3}{2} \cos 2x \Big|_{-\pi/2}^{\pi/2} \quad \frac{3}{2} - \frac{3}{2}$$

$$9. \int_0^{\pi/4} \sec^2 x dx$$

$$\tan x \Big|_0^{\pi/4}$$

$$10. \int_{-1}^2 x\sqrt{5-x^2} dx$$

$$u=5-x^2 \quad du=-2x \quad \int_4^1 -\frac{1}{2}u^{1/2}$$

$$11. \int_{-1}^1 \frac{x^2}{(x^3+9)^2} dx$$

$$u=x^3+9 \quad du=3x^2$$

$$\int_8^{10} \frac{1}{3} \cdot \frac{1}{u^2}$$

$$12. \int_0^{\pi/4} \frac{\sec^2 x}{(1+7 \tan x)^{2/3}} dx$$

$$u=1+7 \tan x \quad du=7 \sec^2 x dx$$

$$\int_1^{\frac{1}{7}} \frac{1}{u^{2/3}}$$

$$7. \frac{-1}{3}$$

$$8. \frac{0}{1}$$

$$9. \frac{1}{1}$$

$$10. \frac{7}{3}$$

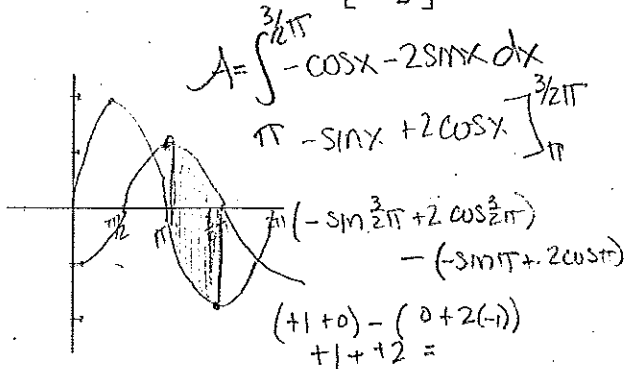
$$11. \frac{1}{120}$$

$$12. \frac{3}{7}$$

JUST AREA \rightarrow NO volume!

13. Find the area between $y = 2\sin x$ and

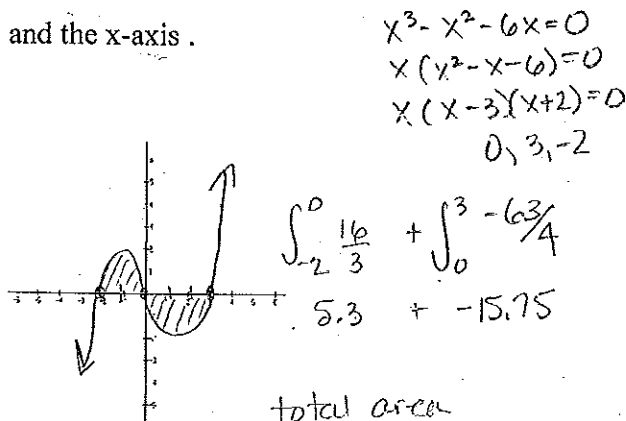
$y = -\cos x$ on the interval $[\pi, \frac{3\pi}{2}]$.



Answer: 3

14. Find the area bounded by $y = x^3 - x^2 - 6x$

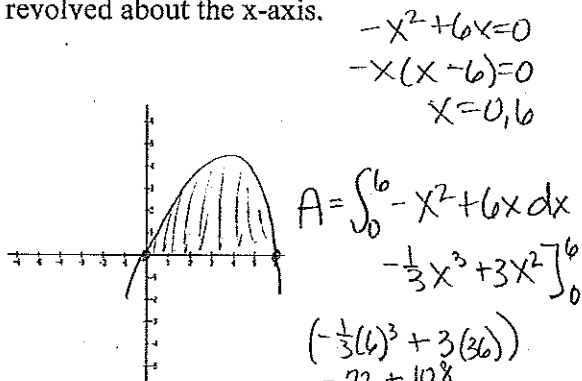
and the x-axis.



total area

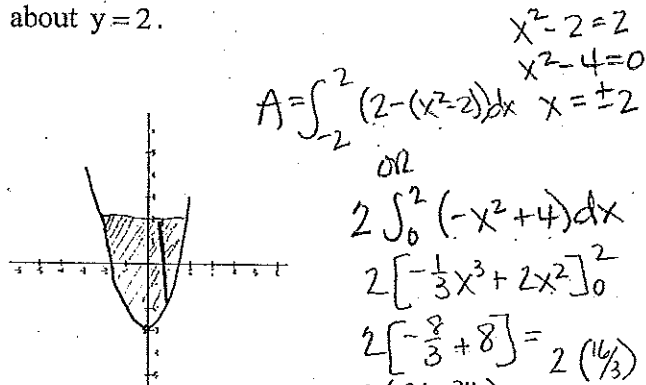
Answer: $\frac{253}{12}$

15. Find the ^{area} volume generated by the region bounded by $y = -x^2 + 6x$ and $y = 0$ revolved about the x-axis.



Answer: 36

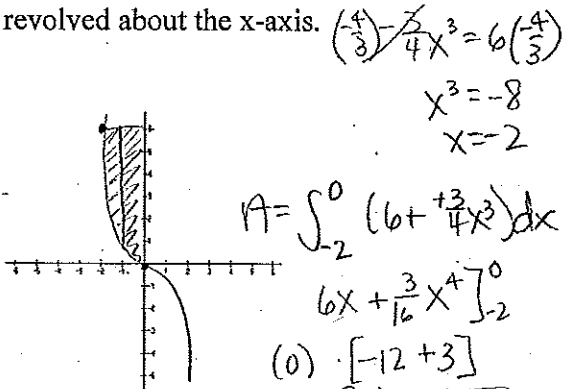
16. Find the ^{area} volume generated by the region bounded by $y = x^2 - 2$ and $y = 2$ revolved about $y = 2$.



Answer: $\frac{32}{3}$

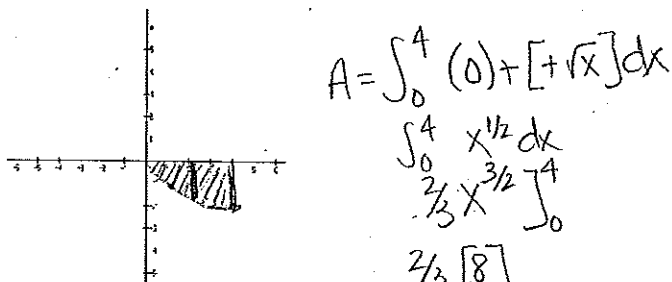
≈ 10.667

17. Find the ^{area} volume generated by the region bounded by $y = -3/4x^3$, $y = 6$, and $x = 0$ revolved about the x-axis.



Answer: 9

18. Find the ^{area} volume generated by the region bounded by $y = -\sqrt{x}$, $x = 4$, and $y = 0$ revolved about $y = 3$.



Answer: $\frac{16}{3}$