

Math 142 Solutions to Sample Exam III (A, B, C, and D)

Sample Exam IIIA:

Multiple Choice

1. E
2. C
3. B
4. D
5. A
6. C
7. B
8. B
9. D
10. B
11. D
12. D
13. B
14. A
15. D
16. C

Work Out:

1. $1\frac{1}{6}$
2. radius ≈ 9.23 cm and height ≈ 3.74 cm
(min $C = 2(2\pi r^2 h) + 2\pi r h$ where $h = \frac{1000}{\pi r^2}$)

Sample Exam IIIB:

1. $\frac{1}{3}(b^3 - a^3) + e^b - e^a$

2. $-\frac{1}{12}(x^3 + 1)^{-4} + C$

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

4. $e^{x^2+x+4} + C$

5. $\frac{5}{3}$

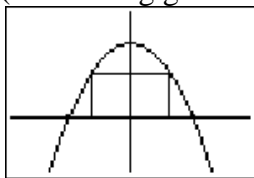
6. Abs. max at $(-2, 16)$ and $(2, 16)$.

Abs. min at $(-\sqrt{\frac{1}{2}}, 3.75)$

and $(\sqrt{\frac{1}{2}}, 3.75)$.

7. a) 291 b) 2997 (not covered in some classes)

8. (no drawing given on the exam) Should look like this:



You want the rectangle with largest area under the curve (above the x -axis) and this is a rectangle with dimensions $2\sqrt{\frac{1}{3}}$ by $\frac{2}{3}$.

9. A

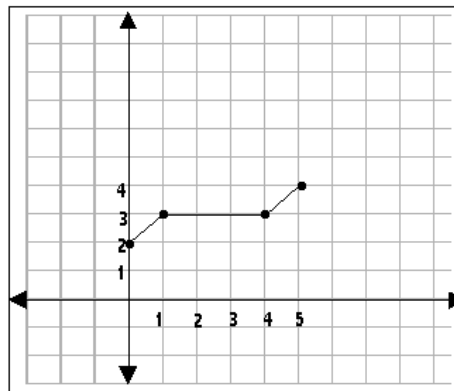
10. about 85 degrees. Use the formula $\bar{T}(x) = \frac{1}{24-0} \int_0^{24} T(x) dx$

and use rectangles to approximate the integral. (Some classes may not have covered this.)

Sample Exam IIIC:

1. C
2. D
3. C
4. B
5. C
6. B
7. C

use graph at right for $v(t)$



graph goes with #7

8. A
9. C
10. A
11. D
12. C
13. C
14. B
15. B (note the answers are y-values)
16. $\frac{1}{2}(e^4 - e^2 + 1) - 4 \ln 2 \approx 21.33$
17. $\frac{1}{2} \ln |e^{2x} + 1| + C$
18. 0.25
19. this one is from Ch. 7:

$$R(x, y) = -9x^2 - 4y^2 + 2xy + 130y + 230x$$

and $R(20, 30) = 2500$

Sample Exam IIID: (actually has 3A at top) This one is very challenging compared to the others.

Multiple Choice

1. A
2. B
3. D
4. C
5. D
6. C
7. C
8. A
9. A
10. B
11. B
12. D
13. C
14. C
15. C
16. C
17. B

Work Out

18. $2.5a$
19. $x = 11$ and $y = 22$
20. 1.4856, overestimate
21. let $x =$ length of bottom edges (in feet) and $h =$ height in feet.
minimize $C(x) = 4x^2 + \frac{8}{x}$.