

Answers to Past Final Exams
Fall 2006

1. A
2. B
3. A
4. D
5. D
6. C
7. B
8. E
9. B and D
10. A
11. C
12. C
13. $A = \cos^{-1}\left(\frac{3}{\sqrt{10}}\right)$
14. $\frac{3}{8}$
15. $\frac{13}{9}$
16. $\frac{1600}{9\pi(75)^2}$ cm/sec
17. $\frac{512\pi}{81}$ (NOTE: no units given in problem)
18. $\mathbf{r}(t) = (20t)\mathbf{i} + (-4.9t^2 + 20\sqrt{3}t)\mathbf{j}$; distance = $\frac{4000\sqrt{3}}{49}$ m.
19. (NOTE: I am calling the last intercept x) inc $(a, d) \cup (x, \infty)$; dec $(-\infty, a) \cup (d, x)$; conc up $(-\infty, b) \cup (e, \infty)$; conc down (b, e) .
20. $\frac{34}{3}$

Fall 2007

1. C
2. A
3. D
4. E
5. A
6. C
7. C
8. A
9. B
10. A
11. D
12. E
13. A
14. $\frac{1}{3}$
15. 50 km/hr
16. Vector: $\mathbf{r}(t) = \left(\frac{\pi}{2} + t\right) \mathbf{i} + \left(-\frac{\pi}{2}t\right) \mathbf{j}$; Cartesian: $y = -\frac{\pi}{2} \left(x - \frac{\pi}{2}\right)$
17. $4\sqrt{2} \times 2\sqrt{2}$ (no units given)
18. (a) HA: $y = 0$; VA: $x = 3$
(b) dec: $(-\infty, -3) \cup (3, \infty)$; inc: $(-3, 3)$
(c) local min $(-3, -\frac{1}{12})$; no local max
19. (a) $\frac{\pi}{6}$
(b) $\frac{72}{5}$

Fall 2008

1. C
2. E
3. D
4. A
5. D
6. B
7. A
8. E
9. B
10. D
11. E
12. $4 \ln|x| - \frac{3}{2} \ln|1+x^2| + \tan^{-1}x + C$ (NOTE: middle term requires 6.5)
13. $e^{-1/2}$
14. $r = \sqrt{\frac{10}{3}}$ inches
15. $50\sqrt{91}$ mph
16. $y = \frac{1}{2}x$ OR $x = 2t, y = t$
17. $m = -2, y = -2x + 9$ (MUST use $\lim_{h \rightarrow 0}$ or $\lim_{x \rightarrow 3}$)
18. $\mathbf{F}_R = (3 + \sqrt{3})\mathbf{i} + \mathbf{j}; |\mathbf{F}_R| = \sqrt{13 + 6\sqrt{3}}; \theta = \tan^{-1}\left(\frac{1}{3 + \sqrt{3}}\right)$