Exam 2 Review: Worksheet 2

1. $\lim\limits_{x\to\infty} \dfrac{2x^3 - 11x^2 - 5x}{2 - 7x - 5x^3}$

2. $\lim\limits_{x\to\infty} \left(\sqrt{4x^2 + 3x} - 2x \right)$

3. $\lim\limits_{x\to\infty} \left(\sqrt{2x + 3} - 2x \right)$

4. $\lim\limits_{x\to\infty} \left(\sqrt{9x^2 + x} - 3x \right)$

5. $\lim\limits_{x\to\infty} \left(\sqrt{x + 1} - 3x \right)$

6. $\lim\limits_{x\to\infty} \left(\sqrt{x + 1} - \sqrt{x} \right)$

7. [Multiple Choice] Which of the functions below has a horizontal asymptote?

(a) $f(x) = \frac{x}{x^2+1}$

(b) $f(x) = \frac{3x^3+9}{2x^3+x^2+1}$

(c) $f(x) = \frac{x^5}{x^3+1}$

8. [Multiple Choice] Which of the functions below has a vertical asymptote?

(a) $f(x) = \frac{x}{x^2+1}$

(b) $f(x) = \frac{x^2}{x^2+1}$

(c) $f(x) = \frac{x}{x^2-1}$

9. [Multiple Choice] Which of the functions below has a slant asymptote?

(a) $f(x) = \frac{2x^2-1}{x+1}$

(b) $f(x) = \frac{2x^2-1}{2x^2+1}$

(c) $f(x) = \frac{x^3}{x^4+1}$

10. $\displaystyle \int \left(16x^3 - 21x^2 + 12x - 10 \right) dx$

11. $\displaystyle \int \left(36x^3 - 21x^2 + 14x - 4 \right) dx$

12. $\displaystyle \int \left(4x^9 + 5 \sec x \tan x \right) dx$

13. $\displaystyle \int \frac{7 - 6x^7}{x^4} \, dx$

14. $\displaystyle \int \frac{5 - 3x^8}{x^4}$

15. $\displaystyle \int \left(\frac{7}{\sqrt[3]{x}} - 6\sqrt[3]{x^2} \right) dx$

16. $\displaystyle \int \left(4\sqrt[5]{x^7} - \frac{2}{\sqrt[6]{x}} \right) dx$

17. A particle moving along a coordinate axis has acceleration $a(t) = (t + 2)^3$.
 (a). If the initial velocity is 7 units/s^2, find $v(t)$.
 (b). If the particle begins moving from 5 units to the right of the origin, find the position function $s(t)$.

18. $\int \left(4\sec^2(x) - 4\right) dx$

19. $\int \left(4\sin x - 3\cos x\right) dx$

20. $\int \left(-\pi\sin x + \sec x \tan x\right) dx$

21. $\int \left(9\cos x - \sqrt[10]{x^3}\right) dx$

22. $\sum\limits_{i=1}^{n}(8i + 6)$

23. $\sum\limits_{i=1}^{n}(9i^2 + 8i)$

24. $\sum\limits_{i=1}^{10}(2i + 4)$

25. $\sum\limits_{i=1}^{10}(6i^2 + 2i)$