Answers to Sample Exam I Problems

1. a
2. a
3. e
4. e
5. c
6. c
7. d
8. d
9. c
10. a
11. d
12. a
13. a
14. a
15. c
16. b
17. $\mathbf{F} = \langle 5, 6\rangle$; $|\mathbf{F}| = \sqrt{61}$;
    direction $\theta = \arctan(\frac{6}{5}) \approx 50^\circ$
18. a.) $\frac{5}{2}$
    b.) -1
19. The lines are tangent to the parabola at the points $(3, 12)$ and $(1, 2)$.
20. Vector equation: $\langle 3 + 3t, 4 + 3t\rangle$,
    Cartesian equation: $y = x + 1$
21. $\left\langle \frac{14}{17}, \frac{-56}{17} \right\rangle$
22. $f'(-1) = \frac{-3}{2\sqrt{5}}$
23. $y = -11x + 25$
24. The limit does not exist because
    $\lim_{x\to 3^+} f(x) = \frac{1}{6}$ while $\lim_{x\to 3^-} f(x) = \frac{-1}{6}$
25. $a = \frac{7}{3}$, $b = \frac{-1}{3}$