Comment:  8 points for each correct answer. Median 23. (Students who followed directions and remained seated until the class was over received two bonus points.)

FORM 1 SOLUTION

1. True. (Part of Duality Theorem.)
2. True.
3. True. $x = 0$ satisfies the constraints.
4. True. $(D)$ is not feasible by duality and $(D')$ has the same feasible set as $(D)$.
5. True. $(D)$ has a solution if and only if $(D')$ has a solution (because the only difference is that the objective functions differ by multiplication by a positive constant). Hence $(P)$ has a solution by Duality.
6. True. If $(D')$ is not feasible, then $(D)$ is not feasible, so $(P)$ cannot have a solution.
7. False. $(A = 0$ but $c > 0$ is possible.)
8. True. $(P)$ has the same objective function and a smaller feasible set.

FORM 2 SOLUTION

1. True. (Part of Duality Theorem.)
2. True.
3. False.
4. True. $(P')$ has a larger feasible set since $\alpha b \geq b$.
5. True. $(D)$ has a solution if and only if $(D')$ has a solution (because the only difference is that the objective functions differ by multiplication by a positive constant). Hence $(P)$ has a solution by Duality.
6. True. If $(D')$ is not feasible, then $(D)$ is not feasible, so $(P)$ cannot have a solution.
7. False. (Like 3.)
8. True. $(P)$ has the same objective function and a smaller feasible set.

FORM 3 SOLUTION

1. True. (Part of Duality Theorem.)
2. False. $y \geq 0$ constraint missing.
3. True. $(D')$ has larger feasible set (because $y \geq 0$ is missing in $(D')$).
4. False. $(P')$ need not have a larger feasible set (need $b \geq 0$ for statement to be true).
5. True. $(D)$ has a nonempty feasible set by duality and $(D')$ has a bigger feasible set than $(D)$.
6. True. If $(D')$ is not feasible, then $(D)$ is not feasible, no $(P)$ cannot have a solution.
7. True. $(P')$ has solution implies dual of $(P')$ has a solution. The feasible set of the dual of $(P')$ is the same as the feasible set of $(D)$.
8. False. (This would be true if $b \geq 0$.)