Answers to selected exercises from Colley, Section 1.8

12. TRUE. The lines are parallel or equal because their directions are given by $(-6, 2, -4) = -2 \cdot (3, -1, 2)$.

22. FALSE. No values of s and t yield the point $(1, 2, 1)$.

26. TRUE. The equation is equivalent to $r^2 = 4r \sin\theta$, so that $x^2 + y^2 - 4y = 0$, or equivalently $x^2 + (y-2)^2 = 4$.

28. TRUE. The equation defines the plane $x = 3$.

30. FALSE. The correct equation is $\tan\phi = \frac{1}{2}$.