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| 13-16  The double-reduction helical gearset shown in the figure is driven through shaft *a* at a speed of 700 rev/min. Gears 2 and 3 have a normal diametral pitch of 12 teeth/in, a 30° helix angle, and a normal pressure angle of 20°. The second pair of gears in the train, gears 4 and 5, have a normal diametral pitch of 8 teeth/in, a 25° helix angle, and a normal pressure angle of 20°. The tooth numbers are: *N*2 5 12, *N*3 5 48, *N*4 5 16, *N*5 5 36. Find:  (*a*) The directions of the thrust force exerted by each gear upon its shaft (*b*) The speed and direction of shaft *c* (*c*) The center distance between shafts |  |

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| 13-20 |  |

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| 13-30 |  |