习题 7.4 答案与提示

1. (1) 共面;　　(2) 不共面.
2. (1) 否;　(2) 否;　(2) 是.
3. (1) 平行于 z 轴;　(2) 平行于 yOz 面;　　(3) 过 z 轴;　　(4) 过 y 轴.
4. (1) $2(x-1)-(y+2)-5(z-3)=0$;
   (2) $\dfrac{x}{2}+\dfrac{y}{-3}+\dfrac{z}{1}=1$;
   (3) $x+y+z-2=0$;
   (4) $3x-6y+2z-49=0$;
   (5) $7x-21y-9z=20$;
   (6) $y-3z=0$;
   (7) $3x+2z-5=0$;
   (8) $y=2$;
   (9) $x+5y-z+16=0$;
   (10) $15x+y+50z-167=0$;
   (11) $2x+y+2z\pm 2\sqrt[3]{3}=0$.
5. (1) 在平面 $y=-2$ 上(垂直于 Oy 轴);　(2) 平行于 Ox 轴(垂直于 yOz 面);
   (3) 过原点;　　(4) 在 xOy 面上.
6. (1) $\dfrac{x-1}{2}=\dfrac{y-2}{-1}=\dfrac{z-3}{1}$,　$x=1+2t, y=2-t, z=3+t$;
   (2) $\dfrac{x+1}{1}=\dfrac{y-2}{0}=\dfrac{z}{-3}$,　$x=-1+t, y=2, z=-3t$;
   (3) $\dfrac{x-2}{0}=\dfrac{y+3}{1}=\dfrac{z-8}{0}$,　$x=2, y=t, z=8$;
   (4) $\dfrac{x-2}{3}=\dfrac{y+3}{-2}=\dfrac{z-8}{5}$, $x=2+3s, y=-3-2s, z=8+5s$;
   (5) $\dfrac{x-1}{1}=\dfrac{y+3}{5}=\dfrac{z-2}{-1}$;
   (6) $\dfrac{x-1}{1}=\dfrac{y-2}{-4}=\dfrac{z-3}{4}$;
   (7) $\dfrac{x-1}{1}=\dfrac{y+3}{-3}=\dfrac{z-2}{0}$;
   (8) $\dfrac{x+1}{3}=\dfrac{y-2}{-1}=\dfrac{z-1}{1}$;
   (9) $\dfrac{x-1}{4}=\dfrac{y-2}{6}=\dfrac{z-3}{5}$;
   (10) $\dfrac{x-3}{1}=\dfrac{y-4}{\sqrt{2}}=\dfrac{z+4}{-1}$
7. $\begin{cases}4x-y+2z-1=0\\ z=0\end{cases}$, $\begin{cases}4x-y+2z-1=0\\ x=0\end{cases}$, $\begin{cases}4x-y+2z-1=0\\ y=0\end{cases}$

8. (1) $\frac{x}{9}=\frac{y-1}{7}=\frac{z-4}{10}$; (2). $\frac{x+5}{3}=\frac{y+8}{2}=\frac{z}{1}$.

9. (1) $\frac{8\sqrt{14}}{7}$; (2) 3; (3) $x+2y-2z-1=\pm 6$.

10. (1) $\frac{\pi}{3}$; (2) 0, 平行; (3) $\frac{\pi}{2}$, 垂直; (4) $\arccos\frac{8}{21}$.

11. (1) 异面; (2) 相交于(1,0,1); (3) 平行; (4) 异面.

12. (1) 0, 平行; (2) $\frac{\pi}{2}$, 垂直相交于$\left(\frac{3}{2},-1,-\frac{1}{2}\right)$;

(3) 0, 直线在平面上; (4) $\arcsin\frac{15\sqrt{77}}{154}$, 相交于$(1,1,1)$.

13. (1) $4(x-3)-(y+2)+3(z+1)=0$; (2) $2\sqrt{5}$; (3) $(-5,2,4)$; (4) $\left(\frac{37}{7},\frac{25}{7},\frac{41}{7}\right)$.

14. $\frac{\sqrt{3}}{3}$, $\frac{x-1}{1}=\frac{y-2}{1}=\frac{z-6}{-1}$, $\left(\frac{4}{3},\frac{7}{3},\frac{17}{3}\right)$, $(1,2,6)$.

15. $\begin{cases}y-z-1=0\\x+y+z=0\end{cases}$, 或$\frac{x-\frac{1}{3}}{-2}=y-\frac{1}{3}=z+\frac{2}{3}$.

16. $x+3y+3z=0, 9x+8y-11z=0.$

17. (1) $x+2y-2z-1=0$; (2) $2x-z+5=0$; (3) $x+2y-2z-1=0$

(4) $x+y+z=4$; (5) $y+z=0$ 和 $y-z=0$; (6) $x+20y+7z-12=0$.

18. (1) $\frac{x-1}{0}=\frac{y-1}{1}=\frac{z+1}{-1}$; (2) $\frac{x+1}{48}=\frac{y}{37}=\frac{z-4}{4}$; (3) $\frac{x-1}{-3}=\frac{y-2}{2}=\frac{z-1}{5}$.

19. $4x+4y+10z-63=0$.