Equations of planes, and distances worksheet – Grade 12

Grade 12 · Mixed level · 20 questions · **Version X1378**

Name: _____ Date: _____ Score: ___ / 20

Scan to check answers + earn stars

Done the worksheet? Scan the code (or enter version X1378 on this skill's page at themathmeridian.com) to check your answers online and earn stars.

1. The point (−8, −4, k) lies on the plane $-6x - 4y + 2z - 50 = 0$. Find k.

   Answer: _____

2. What is a normal vector to the plane $5x + 3y - 6z + 19 = 0$? Type it as [a, b, c].

   Answer: _____

3. A plane has normal vector $[-3, 2, -6]$ and passes through (−4, 1, −5). Its equation is $-3x + 2y - 6z + D = 0$. What is D?

   Answer: _____

4. A plane has normal vector $[-3, 7, 1]$ and passes through (5, −6, 2). Its equation is $-3x + 7y + z + D = 0$. What is D?

   Answer: _____

5. What is a normal vector to the plane $-7x - 4y - 5z + 8 = 0$? Type it as [a, b, c].

   Answer: _____

6. The point (4, −6, k) lies on the plane $-3x + 6y - 4z + 28 = 0$. Find k.

   Answer: _____

7. A plane has normal vector $[3, -7, -3]$ and passes through (7, 5, −7). Its equation is $3x - 7y - 3z + D = 0$. What is D?

   Answer: _____

8. The plane $-x + 4y - 3z - 28 = 0$ is parallel to a plane through (2, 5, 7) with equation $-x + 4y - 3z + D = 0$. What is D?

   Answer: _____

The Math Meridian

© The Math Meridian · themathmeridian.com · Free for personal and classroom use

9. For what value of k are the planes $-7x - 4y + 3z - 3 = 0$ and $6x - 6y + kz + 3 = 0$ perpendicular?

   Answer: _____

10. Which is the scalar equation of the plane through A(8, 3, −2), B(8, 2, −6) and C(10, 6, −5)?

    A. $-8x + 15y + 2z - 92 = 0$ **B.** $15x - 8y + 2z + 92 = 0$

    C. $15x - 8y + 2z - 91 = 0$ **D.** $15x - 8y + 2z - 92 = 0$

11. For what value of k are the planes $6x - 6y + z - 9 = 0$ and $-x + 4y + kz - 7 = 0$ perpendicular?

    Answer: _____

12. The plane $-5x + 7y + 7z + 98 = 0$ is parallel to a plane through (7, −5, −6) with equation $-5x + 7y + 7z + D = 0$. What is D?

    Answer: _____

13. Which is the scalar equation of the plane through A(−3, −5, 8), B(−2, −9, 11) and C(−2, −8, 11)?

    A. $3y - z + 17 = 0$ **B.** $3x - z + 18 = 0$ **C.** $3x - z - 17 = 0$

    D. $3x - z + 17 = 0$

14. Which is the scalar equation of the plane through A(5, 8, −6), B(2, 11, −4) and C(8, 6, −9)?

    A. $5x + 3y + 3z - 32 = 0$ **B.** $3x + 5y + 3z - 31 = 0$ **C.** $5x + 3y + 3z + 31 = 0$

    D. $5x + 3y + 3z - 31 = 0$

15. What is the distance from (−8, −5, 0) to the plane $2x - 3y - 6z - 9 = 0$? (Give a fraction if needed.)

    Answer: _____

16. Find the distance between the parallel planes $9x + 8y - 12z + 5 = 0$ and $9x + 8y - 12z + 8 = 0$. (Give a fraction if needed.)

    Answer: _____

17. Work out the distance between the parallel planes $-2x + 6y - 3z - 6 = 0$ and $-2x + 6y - 3z - 29 = 0$. (Give a fraction if needed.)

    Answer: _____

18. Work out the acute angle between the planes $-5x + 2z - 3 = 0$ and $6x - y - 5z = 0$, to the nearest tenth of a degree.

    Answer: _____ °

The Math Meridian

19. Find the acute angle between the planes $x + 6y + 6z - 3 = 0$ and $-4x - 6y - 6z - 3 = 0$, to the nearest tenth of a degree.

    Answer: _____ °

20. Work out the distance from (2, 5, −1) to the plane $x - 12y + 12z + 13 = 0$. (Give a fraction if needed.)

    Answer: _____

The Math Meridian

Answer key · Version X1378

Equations of planes, and distances worksheet – Grade 12 · Grade 12 · to reprint this sheet or check the answers, enter X1378 on the skill page.

1. **-7**
2. **[5, 3, -6]**
3. **-44**
4. **55**
5. **[-7, -4, -5]**
6. **-5**
7. **-7**
8. **3**
9. **6**
10. **D (**$15x - 8y + 2z - 92 = 0$**)**
11. **30**
12. **112**
13. **D (**$3x - z + 17 = 0$**)**
14. **D (**$5x + 3y + 3z - 31 = 0$**)**
15. **10/7**
16. **3/17**
17. **23/7**
18. **19.4**
19. **18.5**
20. **57/17**

The Math Meridian