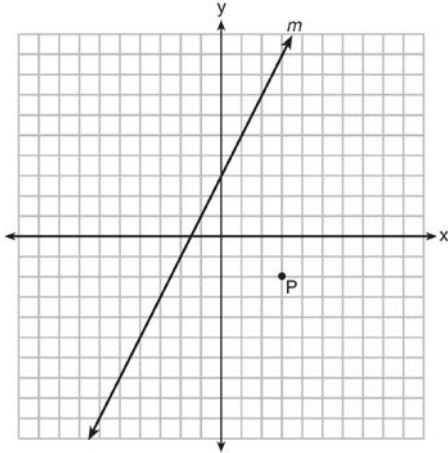## G.GPE.B.5: Parallel and Perpendicular Lines 3
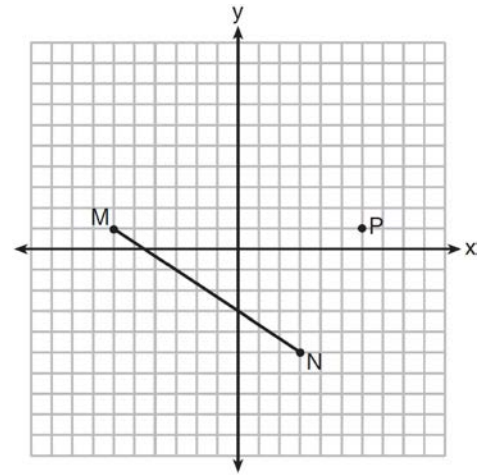
1   Line *m* and point *P* are shown in the graph below.

Which equation represents the line passing through *P* and parallel to line *m*?
1) $y - 3 = 2(x + 2)$
2) $y + 2 = 2(x - 3)$
3) $y - 3 = -\frac{1}{2}(x + 2)$
4) $y + 2 = -\frac{1}{2}(x - 3)$

2   Given $\overline{MN}$ shown below, with $M(-6, 1)$ and $N(3, -5)$, what is an equation of the line that passes through point $P(6, 1)$ and is parallel to $\overline{MN}$?

1) $y = -\frac{2}{3}x + 5$
2) $y = -\frac{2}{3}x - 3$
3) $y = \frac{3}{2}x + 7$
4) $y = \frac{3}{2}x - 8$

3   Which equation represents a line parallel to the line whose equation is $-2x + 3y = -4$ and passes through the point $(1, 3)$?
1) $y - 3 = -\frac{3}{2}(x - 1)$
2) $y - 3 = \frac{2}{3}(x - 1)$
3) $y + 3 = -\frac{3}{2}(x + 1)$
4) $y + 3 = \frac{2}{3}(x + 1)$

4   What is the equation of a line passing through $(2,-1)$ and parallel to the line represented by the equation $y = 2x + 1$?

1) $y = -\dfrac{1}{2}x$

2) $y = -\dfrac{1}{2}x + 1$

3) $y = 2x - 5$

4) $y = 2x - 1$

5   What is an equation of the line that passes through the point $(-2,3)$ and is parallel to the line whose equation is $y = \dfrac{3}{2}x - 4$?

1) $y = \dfrac{-2}{3}x$

2) $y = \dfrac{-2}{3}x + \dfrac{5}{3}$

3) $y = \dfrac{3}{2}x$

4) $y = \dfrac{3}{2}x + 6$

6   Which equation represents a line that is parallel to the line whose equation is $y = \dfrac{3}{2}x - 3$ and passes through the point $(1,2)$?

1) $y = \dfrac{3}{2}x + \dfrac{1}{2}$

2) $y = \dfrac{2}{3}x + \dfrac{4}{3}$

3) $y = \dfrac{3}{2}x - 2$

4) $y = -\dfrac{2}{3}x + \dfrac{8}{3}$

7   Which equation represents the line that passes through the point $(-2,2)$ and is parallel to $y = \dfrac{1}{2}x + 8$?

1) $y = \dfrac{1}{2}x$

2) $y = -2x - 3$

3) $y = \dfrac{1}{2}x + 3$

4) $y = -2x + 3$

8   What is an equation of the line that passes through the point $(4,5)$ and is parallel to the line whose equation is $y = \dfrac{2}{3}x - 4$?

1) $2y + 3x = 11$

2) $2y + 3x = 22$

3) $3y - 2x = 2$

4) $3y - 2x = 7$

9   What is an equation of the line that passes through the point $(-2,1)$ and is parallel to the line whose equation is $4x - 2y = 8$?

1) $y = \dfrac{1}{2}x + 2$

2) $y = \dfrac{1}{2}x - 2$

3) $y = 2x + 5$

4) $y = 2x - 5$

10 Line ℓ passes through the point $(5,3)$ and is parallel to line k whose equation is $5x + y = 6$. An equation of line ℓ is

1) $y = \dfrac{1}{5}x + 2$

2) $y = -5x + 28$

3) $y = \dfrac{1}{5}x - 2$

4) $y = -5x - 28$

11 Which line is parallel to the line whose equation is $4x + 3y = 7$ and also passes through the point $(-5,2)$?

1) $4x + 3y = -26$

2) $4x + 3y = -14$

3) $3x + 4y = -7$

4) $3x + 4y = 14$

12 What is the equation of a line that passes through the point $(-3, -11)$ and is parallel to the line whose equation is $2x - y = 4$?
1) $y = 2x + 5$
2) $y = 2x - 5$
3) $y = \frac{1}{2}x + \frac{25}{2}$
4) $y = -\frac{1}{2}x - \frac{25}{2}$

13 What is an equation of the line that passes through the point $(7, 3)$ and is parallel to the line $4x + 2y = 10$?
1) $y = \frac{1}{2}x - \frac{1}{2}$
2) $y = -\frac{1}{2}x + \frac{13}{2}$
3) $y = 2x - 11$
4) $y = -2x + 17$

14 Which equation represents the line parallel to the line whose equation is $4x + 2y = 14$ and passing through the point $(2, 2)$?
1) $y = -2x$
2) $y = -2x + 6$
3) $y = \frac{1}{2}x$
4) $y = \frac{1}{2}x + 1$

15 What is the equation of a line passing through the point $(6, 1)$ and parallel to the line whose equation is $3x = 2y + 4$?
1) $y = -\frac{2}{3}x + 5$
2) $y = -\frac{2}{3}x - 3$
3) $y = \frac{3}{2}x - 8$
4) $y = \frac{3}{2}x - 5$

16 An equation of the line that passes through $(2, -1)$ and is parallel to the line $2y + 3x = 8$ is
1) $y = \frac{3}{2}x - 4$
2) $y = \frac{3}{2}x + 4$
3) $y = -\frac{3}{2}x - 2$
4) $y = -\frac{3}{2}x + 2$

17 What is the equation of a line passing through the point $(4, -1)$ and parallel to the line whose equation is $2y - x = 8$?
1) $y = \frac{1}{2}x - 3$
2) $y = \frac{1}{2}x - 1$
3) $y = -2x + 7$
4) $y = -2x + 2$

18 Which equation represents a line that passes through the point $(-2, 6)$ and is parallel to the line whose equation is $3x - 4y = 6$?
1) $3x + 4y = 18$
2) $4x + 3y = 10$
3) $-3x + 4y = 30$
4) $-4x + 3y = 26$

19 Write an equation of a line that is parallel to the line whose equation is $3y = x + 6$ and that passes through the point $(-3, 4)$.

20 Find an equation of the line passing through the point $(5, 4)$ and parallel to the line whose equation is $2x + y = 3$.

21 Write an equation of the line that passes through the point $(6, -5)$ and is parallel to the line whose equation is $2x - 3y = 11$.

22 Write an equation of the line that is parallel to the line whose equation is $3y + 7 = 2x$ and passes through the point $(2, 6)$.

G.GPE.B.5: Parallel and Perpendicular Lines 3
Answer Section

1 ANS: 2   REF: 081420ge

2 ANS: 1

$$m = -\frac{2}{3} \quad 1 = \left(-\frac{2}{3}\right)6 + b$$

$$1 = -4 + b$$

$$5 = b$$

REF: 081510geo

3 ANS: 2

$$m = \frac{-(-2)}{3} = \frac{2}{3}$$

REF: 061916geo

4 ANS: 3

$$y = mx + b$$

$$-1 = 2(2) + b$$

$$-5 = b$$

REF: 011224ge

5 ANS: 4

$$y = mx + b$$

$$3 = \frac{3}{2}(-2) + b$$

$$3 = -3 + b$$

$$6 = b$$

REF: 011114ge

6 ANS: 1

$$m = \frac{3}{2} \quad y = mx + b$$

$$2 = \frac{3}{2}(1) + b$$

$$\frac{1}{2} = b$$

REF: 081217ge

7 ANS: 3

$y = mx + b$

$2 = \frac{1}{2}(-2) + b$

$3 = b$

REF: 011701geo

8 ANS: 4

$\frac{2}{3}(x - 4) = y - 5$

$2x - 8 = 3y - 15$

$7 = 3y - 2x$

REF: 061528ge

9 ANS: 3

$m = \dfrac{-A}{B} = \dfrac{-4}{-2} = 2 \quad y = mx + b$

$1 = 2(-2) + b$

$1 = -4 + b$

$5 = b$

REF: 081509ge

10 ANS: 2

$m = \dfrac{-A}{B} = \dfrac{-5}{1} = -5 \quad y = mx + b$

$3 = -5(5) + b$

$28 = b$

REF: 011410ge

11 ANS: 2

The slope of a line in standard form is $\dfrac{-A}{B}$, so the slope of this line is $\dfrac{-4}{3}$. A parallel line would also have a slope

of $\dfrac{-4}{3}$. Since the answers are in standard form, use the point-slope formula. $\quad y - 2 = -\dfrac{4}{3}(x + 5)$

$3y - 6 = -4x - 20$

$4x + 3y = -14$

REF: 061123ge

12 ANS: 2

The slope of a line in standard form is $-\dfrac{A}{B}$, so the slope of this line is $\dfrac{-2}{-1} = 2$. A parallel line would also have a slope of 2. Since the answers are in slope intercept form, find the y-intercept: $y = mx + b$

$$-11 = 2(-3) + b$$
$$-5 = b$$

REF: fall0812ge

13 ANS: 4

The slope of a line in standard form is $-\dfrac{A}{B}$, so the slope of this line is $\dfrac{-4}{2} = -2$. A parallel line would also have a slope of -2. Since the answers are in slope intercept form, find the y-intercept: $y = mx + b$

$$3 = -2(7) + b$$
$$17 = b$$

REF: 081010ge

14 ANS: 2

$$m = \frac{-A}{B} = \frac{-4}{2} = -2 \quad y = mx + b$$
$$2 = -2(2) + b$$
$$6 = b$$

REF: 081112ge

15 ANS: 3

$$2y = 3x - 4. \quad 1 = \frac{3}{2}(6) + b$$
$$y = \frac{3}{2}x - 2 \quad 1 = 9 + b$$
$$-8 = b$$

REF: 061316ge

16 ANS: 4

$$m = \frac{-A}{B} = \frac{-3}{2}. \quad y = mx + b$$
$$-1 = \left(\frac{-3}{2}\right)(2) + b$$
$$-1 = -3 + b$$
$$2 = b$$

REF: 061226ge

17 ANS: 1

$$m = \frac{-A}{B} = \frac{1}{2} \quad -1 = \frac{1}{2}(4) + b$$
$$-1 = 2 + b$$
$$-3 = b$$

REF: 061420ge

18 ANS: 3

$$m = \frac{-A}{B} = \frac{-3}{-4} = \frac{3}{4} \quad 6 = \frac{3}{4}(-2) + b \qquad y = \frac{3}{4}x + \frac{15}{2}$$
$$\frac{12}{2} = \frac{-3}{2} + b \qquad 4y = 3x + 30$$
$$-3x + 4y = 30$$
$$\frac{15}{2} = b$$

REF: 011620ge

19 ANS:

$$m = \frac{1}{3} \quad 4 = \frac{1}{3}(-3) + b \quad y = \frac{1}{3}x + 5$$
$$4 = -1 + b$$
$$5 = b$$

REF: 011532ge

20 ANS:

$y = -2x + 14.$ The slope of $2x + y = 3$ is $\frac{-A}{B} = \frac{-2}{1} = -2.$ $y = mx + b$.
$$4 = (-2)(5) + b$$
$$b = 14$$

REF: 060931ge

21 ANS:

$y = \frac{2}{3}x - 9.$ The slope of $2x - 3y = 11$ is $-\frac{A}{B} = \frac{-2}{-3} = \frac{2}{3}.$ $-5 = \left(\frac{2}{3}\right)(6) + b$
$$-5 = 4 + b$$
$$b = -9$$

REF: 080931ge

4

22 ANS:

$3y + 7 = 2x$ $y - 6 = \frac{2}{3}(x - 2)$

$3y = 2x - 7$

$y = \frac{2}{3}x - \frac{7}{3}$

REF: 011925geo