Geometry and Advanced Geometry Chapter 3 Test

1. Tell whether lines m and n are parallel or not parallel and explain (give the theorem).

m || *n*   postulate 16

2. Write the slope-intercept form of the equation of the line passing through the point $(5, -4)$ and perpendicular to the line $y = -\frac{4}{3}x + 5$.
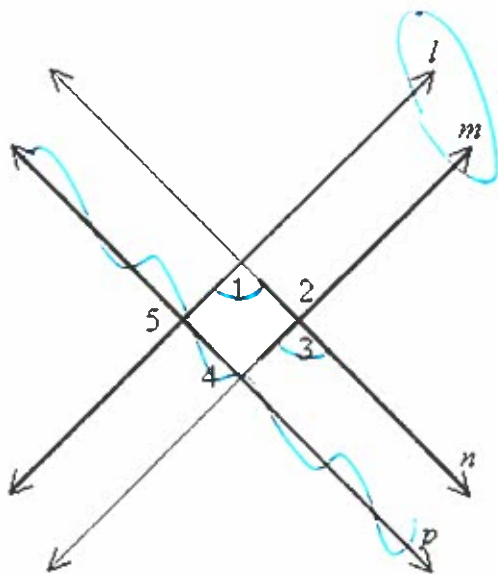
$\perp$ m $= \frac{3}{4}$

$-4 = \frac{3}{4}(5) + b$

$-4 = \frac{15}{4} + b$

$-\frac{31}{4} = b$
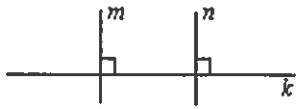
$y = \frac{3}{4}x - \frac{31}{4}$

$\frac{3}{4}$

3. Use the figure and the given information to determine which lines must be parallel. JUSTIFY YOUR ANSWER! (this is not a proof)

Given: $\angle 1 \cong \angle 3$

l || *m*   postulate 16

4. Tell whether lines m and n are parallel or not parallel and explain.

parallel *theorem 3.12* $^{+1/2}$

postulate 16

A.

5. Which best describes the relationship between *Line 1* and *Line 2*?
   Line 1 passes through $(-3, 6)$ and $(-7, 11)$

   ① $\dfrac{11-6}{-7--3} = \dfrac{5}{-4}$ ② $\dfrac{4-8}{-4-1} = \dfrac{-4}{-5} = \dfrac{4}{5}$
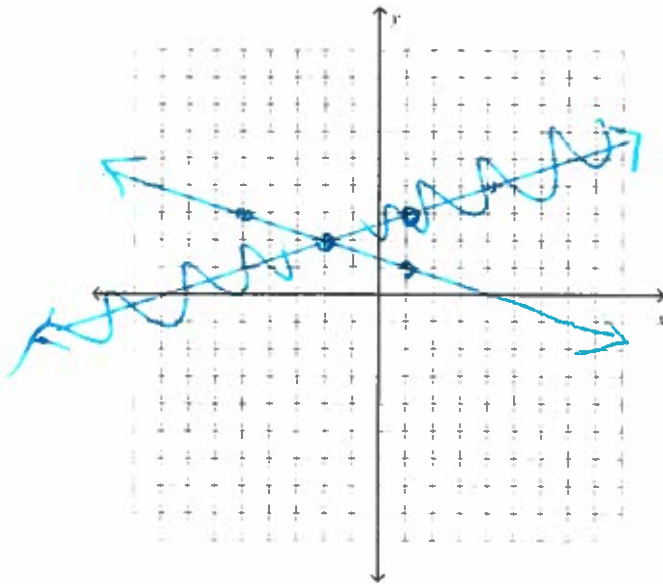
   Line 2 passes through $(1, 8)$ and $(-4, 4)$

   a. perpendicular
   b. They are the same line.
   c. parallel
   d. neither perpendicular nor parallel

6. Line l passes through $(1, 1)$ and $(-2, -8)$. Graph the line perpendicular to l that passes through $(-2, 2)$.

$m = \dfrac{-8-1}{-2-1} = \dfrac{-9}{-3} = 3$

$\perp m = \dfrac{-1}{3}$

7. What is the slope of the line that passes through points A (-2,-3) and B (5,3)?
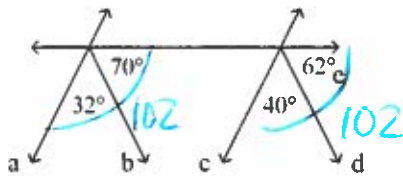
    a. $\frac{6}{7}$ c. $-\frac{6}{7}$ $\frac{3+3}{5+2} = \frac{6}{7}$

    b. $\frac{7}{6}$ d. 0

Which lines, if any, can be proved parallel given the following diagram?

8.

$70°$ $62°$

$32°$ 102 $40°$ 102

a   b   c   d

$a \parallel c$

9. (BONUS) Find the distance from the point (0, 0) to the line with the equation $y = -7x - 8$.

$\perp m = \frac{1}{7}$

$\frac{4}{5}\sqrt{2}$

(1.13)

$\sqrt{(0+1.12)^2 + (0+1.6)^2}$

$(1.12, -1.6)$

$y = \frac{1}{7}x$ $y = -7x-8$

$\frac{1}{7}x = -7x-8$

$x = -49x-56$

$50x = -56$, x

$y = -7x-8$ ... $.12$
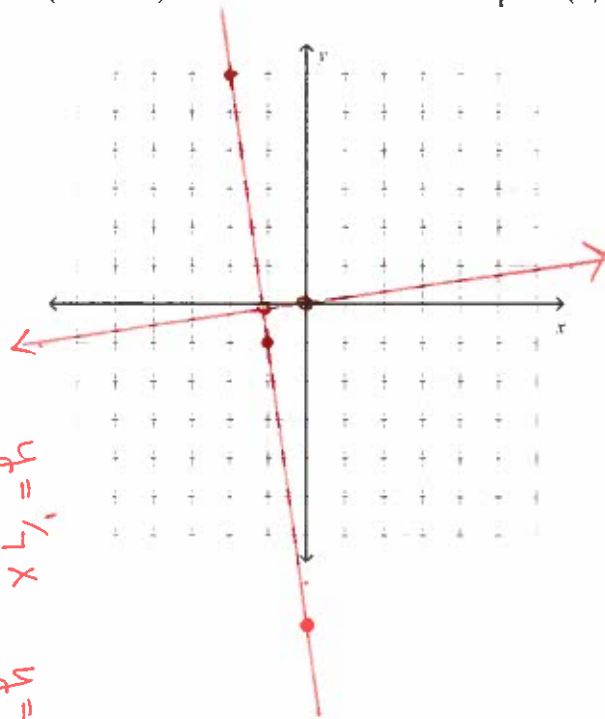
3

10. Write an equation for the line passing through the point $(-3,-5)$ that has a slope of -5.
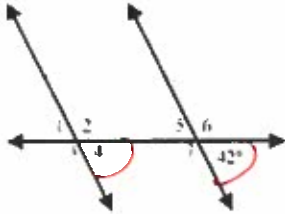
$-5 = -5(-3)+b$
$-5 = 15+b$
$-15 -15$
$-20 = b$

$y = -5x - 20$

11. Use the figure to find the measure of $\angle 4$.

$42°$

12. Find the slope of a line perpendicular to the line containing the points $(3,-7)$ and $(4,-3)$.

$\frac{-3+7}{4-3} = \frac{4}{1} = 4$

$\perp m = -\frac{1}{4}$

C 13. What is the slope of a line perpendicular to the line $-2x+9y=8$?

a. $-\frac{2}{9}$

b. $\frac{2}{9}$

c. $-\frac{9}{2}$

d. $\frac{9}{2}$

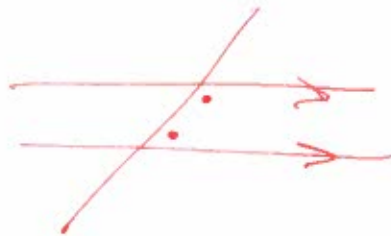$9y = 2x+8$
$y = \frac{2}{9}x + \frac{8}{9}$
$\perp m = \frac{-9}{2}$

True or False:

14. If two parallel lines are intersected by a transversal, then consecutive interior angles are supplementary.

true

4

15. Find the distance between the lines with the equations $y = x + 3$ and $y = x - 2$.

$m = 1$

$\perp m = -1$

$(0,3)(2\frac{1}{2}, \frac{1}{2})$

$\sqrt{(0-2.5)^2 + (3-.5)^2}$

$\sqrt{6.25 + 6.25}$

$\sqrt{12.5}$ $\boxed{3.5}$

16. In the figure below, if l and k are parallel lines, what is the value of $x + y$?
(Find x, Find y, add them together)

$49 + 49 =$

$1°$ 49

49

131°

$\boxed{98°}$

a. 49°

b. 180°

c. 131°

d. 98°

17. Write the slope-intercept form of the equation of the line passing through the point (2, −4) and parallel to the line $y = 5x + 5$.

$m = 5$

$\cancel{m = -\frac{1}{5}}$

$\cancel{-4 = -\frac{1}{5}(2)+b}$

$\cancel{-4 = \frac{-2}{5}+b}$

$-4 = 5(2) + b$

$-4 = 10 + b$

$\underline{-10 \quad -10}$
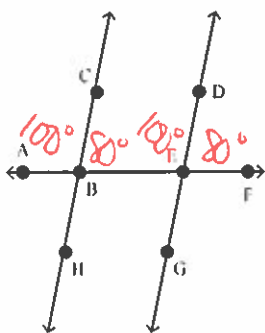
$-14 = b$

$\boxed{y = 5x - 14}$

18. Tell which line through the given points is steeper. *Explain.*

Line 1: $(5,6), (2,5)$ $\dfrac{-1}{-3} = .33$

Line 2: $(10,3), (7,1)$ $\dfrac{-2}{-3} = \dfrac{2}{3} = \boxed{.66}$ line 2

C

19. In the figure shown, $\overleftrightarrow{HC} \parallel \overleftrightarrow{GD}$ and $m\angle ABC = 100°$. Which of the following statements is false?

a. $m\angle CBE = 80°$
b. $m\angle DEF = 80°$
c. $\angle DEB$ and $\angle CBE$ are corresponding angles.
d. $\angle CBE$ and $\angle GEB$ are alternate interior angles.

20. Are the lines with the equations $y = -\dfrac{1}{3}x + 2$ and $y = -\dfrac{1}{3}x - 2$ *parallel*, *perpendicular*, or *skew*? Explain your answer.

Same slopes — parallel

A

21. Write the slope-intercept form of the equation of the line passing through the point $(-2, -5)$ and perpendicular to the line $y = \dfrac{2}{3}x - 1$.

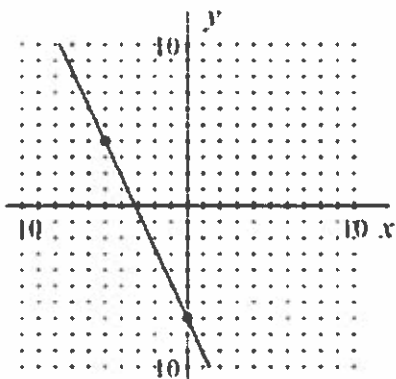a. $y = -\dfrac{3}{2}x - 8$ $\perp m = -\dfrac{3}{2}$ c. $y = \dfrac{3}{2}x + 2$

b. $y = \dfrac{2}{3}x + \dfrac{11}{3}$ d. $y = -\dfrac{2}{3}x - \dfrac{19}{3}$

6

22. Find the slope of the line.

$\frac{4}{3}$

a. $\frac{2}{15}$ c. $\frac{3}{4}$

b. $\frac{15}{2}$ d. $\frac{4}{3}$

23. True or False: If two lines are perpendicular to the same transversal, then they are parallel.

true

24. (BONUS - BE CLEAR AND CONCISE IN YOUR JUSTIFICATION)
    ∠1 and ∠6 are same side exterior angles. What is the relationship between same side exterior angles? Justify your reasoning.

Supplementary.

∠1 ≅ ∠8   exterior angle

∠6 ≅ ∠8   are Supplementary (linear pair)

so ∠1 ∠8 are supplem. (substitution)

A

25. Write an equation in slope-intercept form of the graph shown.

a. $y = -\dfrac{11}{5}x - 7$

b. $y = \dfrac{5}{11}x - 7$

c. $y = \dfrac{11}{5}x - 7$

d. $y = -\dfrac{5}{11}x - 7$

26. What is the slope of a line parallel to the line $9x + 3y = 2$?

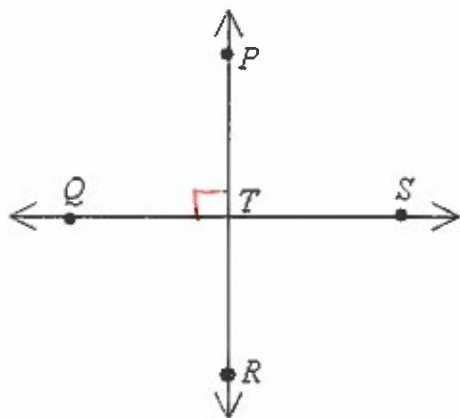$$3y = -9x + 2$$
$$y = -3x + \frac{2}{3}$$
$$m = -3$$
$$m = \frac{1}{3}$$

27. (BONUS)
Given: $\overleftrightarrow{QS} \perp \overleftrightarrow{PR}$
Prove: $m\angle PTS = 90°$

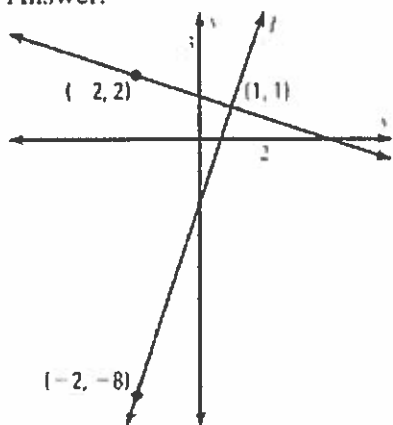① $\overleftrightarrow{QS} \perp \overleftrightarrow{PR}$ ① Given

② $\angle PTS$ is a right angle   ② th. 3.9

③ $m\angle PTS = 90°$ ③ def of right angle.

8

Geometry and Advanced Geometry Chapter 3 Test
Answer Section

1. parallel; Corresponding Angles Converse

2. $y = \frac{3}{4}x - \frac{31}{4}$

3. $l \parallel m$

4. parallel; Lines Perpendicular to a Transversal Theorem (Thm. 3.12)

5. A

6. Answer:

7. A

8.
   $d \parallel c$

9. $\frac{4}{5}\sqrt{2}$

10. $y = -5x - 20$

11. $42°$

12. $-\frac{1}{4}$

13. C

14. True

15. $\frac{5}{2}\sqrt{2}$ 3.5

16. D

17. $y = 5x - 14.$

18. line 2

19. C

20. parallel; Slopes are equal and y-intercepts are different

21. A

22. D

23. True

24. Same side exterior angles are supplementary. $\angle 1 \cong \angle 8$ by the Alternate Exterior Angles Theorem. $\angle 6$ and $\angle 8$ are supplementary since they are a linear pair. Therefore, $\angle 1$ and $\angle 6$ are supplementary since $\angle 1$ and $\angle 8$ have the same measure.

25. A

26. −3

27.

Statements	Reasons
1. $\overleftrightarrow{QS} \perp \overleftrightarrow{PR}$	1. Given
2. $\angle PTS$ is a right $\angle$	2. Theorem 3.9
3. $m\angle PTS = 90°$	3. Definition of a right angle

_A_ 7.

_C_ 19.

_A_ 5.

_D_ 16.

_C_ 13.

_A_ 21.

  D   22.   A   25.