

CHAPTER 3 PRACTICE TEST - OPTIONAL

key

1. Identify all pairs of angles of the given type.

a. Alternate exterior

$\angle 1$ and $\angle 7$; $\angle 4$ and $\angle 6$

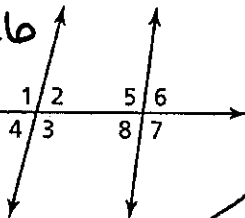
b. Alternate interior

$\angle 3$ and $\angle 5$; $\angle 2$ and $\angle 8$

c. Corresponding

d. Consecutive interior

$\angle 2$ and $\angle 5$; $\angle 3$ and $\angle 8$



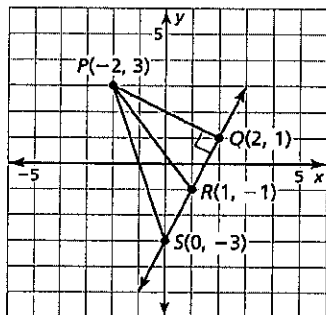
$\angle 1$ and $\angle 5$

$\angle 2$ and $\angle 6$

$\angle 3$ and $\angle 7$

$\angle 4$ and $\angle 8$

2. Find the shortest distance from point P to line QS.



The $\perp$ dist: PQ

$$PQ = \sqrt{(-2-2)^2 + (3-1)^2}$$

$$= \sqrt{(-4)^2 + (2)^2}$$

$$= \sqrt{16 + 4} = \sqrt{20} = 2\sqrt{5}$$

3. Tell whether the lines through the given points are parallel, perpendicular, or neither. Justify your answer.

a. Line 1: (2, 3), (4, 12)

Line 2: (5, 10), (14, 8)

$$\text{slope} = \frac{12-3}{4-2} = \frac{9}{2}$$

$$\text{slope} = \frac{8-10}{14-5} = \frac{-2}{9}$$

$$\left(\frac{-2}{9}\right)\left(\frac{9}{2}\right) = -1$$

product of slopes is -1, so the lines are $\perp$

b. Line 1: (-6, -10), (4, -2)

Line 2: (-8, -6), (0, 4)

$$\text{slope} = \frac{-2-(-10)}{4-(-6)} = \frac{8}{10} = \frac{4}{5}$$

$$\frac{4-(-6)}{0-(-8)} = \frac{10}{8} = \frac{5}{4}$$

The slopes are not the same, nor are their products = -1. So, the lines are neither $\parallel$ or $\perp$.

4. Write the equation of the line passing through (2, -3) that is parallel to $y = -6x + 10$

$\parallel$ slope: $m = -6$

$$y = mx + b$$

$$-3 = (-6)(2) + b$$

$$-3 = -12 + b$$

$$9 = b$$

$$y = -6x + 9$$

5. Write the equation of the line passing through (-10, -4) perpendicular to $5x - y = 6$

$\perp$ slope: $-\frac{1}{5}$

$$y - y_1 = m(x - x_1)$$

$$y - (-4) = -\frac{1}{5}(x - (-10))$$

$$y + 4 = -\frac{1}{5}(x + 10) \rightarrow y + 4 = -\frac{1}{5}x - 2 \rightarrow y = -\frac{1}{5}x - 6$$

$$5x - y = 6$$

$$-y = -5x + 6$$

$$y = 5x - 6$$

$$5(m) = -1$$

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

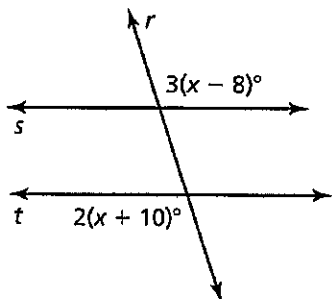
$$y = -\frac{1}{5}x - 6$$

6. Write the equation of the line passing through (5, 7) perpendicular to $x = 3$

horiz. lines are
 $\perp$ to vertical
 lines

vertical!
 horiz: $y = 7$

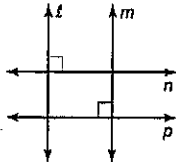
7. Find the value of x that makes line s parallel to line t .



if alt. ext. $\angle s \cong \rightarrow \parallel$
 $3(x - 8) = 2(x + 10)$
 $3x - 24 = 2x + 20$
 $x = 44$

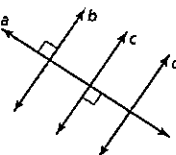
8. Determine which lines, if any, must be parallel.

a.



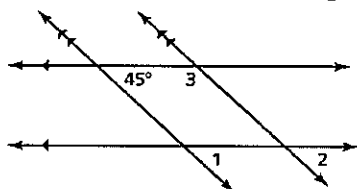
none...

b.



$b \parallel c$

9. Find the measures of angles 1, 2, and 3.

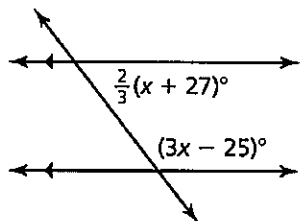


$m\angle 1 = 45^\circ$

$m\angle 2 = 45^\circ$

$m\angle 3 = 135^\circ$

10. Find the value of x .



$\frac{2}{3}(x + 27) + 3x - 25 = 180$

$\frac{2}{3}x + 18 + 3x - 25 = 180$

$\frac{2}{3}x + 3x = 187$

$\frac{2}{3}x + \frac{9}{3}x = 187$

$\frac{11}{3}x = 187$

$11x = 561$

$x = 51$

11. Think of each segment as part of a line. Which line(s) or plane(s) appear to fit the description?

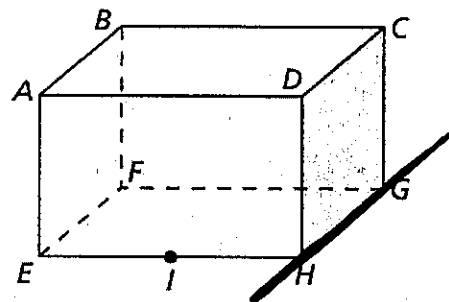
a. Line(s) parallel to line GH and containing point F $\overleftrightarrow{FE}$

b. Line(s) skew to line GH and containing point F $\overleftrightarrow{FB}$

c. Line(s) perpendicular to line GH and containing point F $\overleftrightarrow{FG}$

d. Plane(s) parallel to plane GHD and containing point F

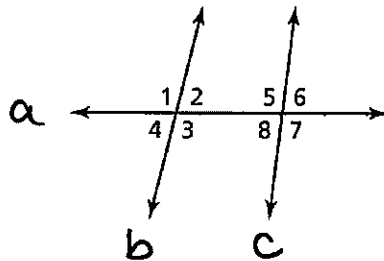
plane ABF



12. Fill in the flow chart proof. (There are two different proofs for this one! Try doing both ☺)

Given: $\angle 2$ is supplementary to $\angle 5$

Prove: $\angle 5 \cong \angle 3$



proof #1

$\angle 2$ is supp.
to $\angle 5$

given

$b \parallel c$

if consec.
int. $\angle s \rightarrow \parallel$
supp

$\angle 5 \cong \angle 3$

if $\parallel \rightarrow$ alt. int. $\angle s \cong$

proof #2

$\angle 2$ is supp
to $\angle 5$

$\angle 2$ is supp
to $\angle 3$

linear pairs
are supp

$\angle 5 \cong \angle 3$

$\cong$ Supps thm

13. Find the measure of angle 1.

