STUDY GUIDE: REVIEW, PAGES 202–205

1. alternate interior angles
2. skew lines
3. transversal
4. point-slope form
5. rise; run

LESSON 3-1

6. Possible answer: $\overline{DE}$ and $\overline{BC}$ are skew.
7. Possible answer: $\overline{AB} \parallel \overline{DE}$
8. Possible answer: $\overline{AD} \perp \overline{DE}$
9. Possible answer: plane $ABC \parallel$ plane DEF
10. ℓ; alt. int. $\measuredangle$
11. n; corr. $\measuredangle$
12. ℓ; same-side int. $\measuredangle$
13. m; alt. ext. $\measuredangle$

LESSON 3-2

14. $x + 90 = 180$
$x = 90$
$m\angle WYZ = x° = 90°$

15. $26x + 22 = 38x - 14$
$22 = 12x - 14$
$36 = 12x$
$3 = x$
$m\angle KLM = 38x - 14$
$= 38(3) - 14$
$= 100°$

16. $33x + 35 = 26x + 49$
$7x + 35 = 49$
$7x = 14$
$x = 2$
$m\angle DEF + (26x + 49) = 180$
$m\angle DEF + 26(2) + 49 = 180$
$m\angle DEF + 101 = 180$
$m\angle DEF = 79°$

17. $17x + 8 = 13x + 24$
$4x + 8 = 24$
$4x = 16$
$x = 4$
$m\angle QRS = 13x + 24$
$= 13(4) + 24$
$= 76°$

LESSON 3-3

18. $\angle 4 \cong \angle 6$, so $c \parallel d$ by the Conv. of the Alt. Int. $\measuredangle$ Thm.

19. $m\angle 1 = (23x + 38)° = 23(3) + 38 = 107°$
$m\angle 5 = (17x + 56)° = 17(3) + 56 = 107°$
$\angle 1 \cong \angle 5$, so $c \parallel d$ by the Conv. of the Corr. $\measuredangle$ Post.

20. $m\angle 6 = (12x + 6)° = 12(5) + 6 = 66°$
$m\angle 3 = (21x + 9)° = 21(5) + 9 = 114°$
$m\angle 6 + m\angle 3 = 66° + 114° = 180°$
$\angle 6$ and $\angle 3$ are supp., so $c \parallel d$ by the Conv. of the Same-Side Int. $\measuredangle$ Thm.

21. $m\angle 1 = 99°$
$m\angle 7 = (13x + 8)° = 13(7) + 8 = 99°$
$\angle 1 \cong \angle 7$, so $c \parallel d$ by the Conv. of the Alt. Ext. $\measuredangle$ Thm.

LESSON 3-4

22. $\overline{KM}$

23. $KM < KL$
$x - 5 < 8$
$x < 13$

24.

Statements	Reasons
1. $\overline{AD} \parallel \overline{BC}$, $\overline{AD} \perp \overline{AB}$, $\overline{DC} \perp \overline{BC}$	1. Given
2. $\overline{AB} \perp \overline{BC}$	2. $\perp$ Transv. Thm.
3. $\overline{AB} \parallel \overline{CD}$	3. 2 lines $\perp$ to the same line $\rightarrow$ the two lines are $\parallel$

SKIP

LESSON 3-5

25. Substitute $(-3, 2)$ for (x_1, y_1) and $(4, 1)$ for (x_2, y_2) in the slope formula and then simplify.
$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - 2}{4 - (-3)} = \frac{-1}{7} = -\frac{1}{7}$

26. Substitute $(1, 4)$ for (x_1, y_1) and $(-2, -1)$ for (x_2, y_2) in the slope formula and then simplify.
$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-1 - 4}{-2 - 1} = \frac{-5}{-3} = \frac{5}{3}$

27. slope of $\overleftrightarrow{EF} = \frac{4 - 2}{-3 - 8} = \frac{2}{-11} = -\frac{2}{11}$
slope of $\overleftrightarrow{GH} = \frac{3 - 1}{-4 - 6} = \frac{2}{-10} = -\frac{1}{5}$
The slopes are not the same, so the lines are not parallel. The product of the slopes is not -1, so the lines are not perpendicular.

28. slope of $\overleftrightarrow{JK} = \frac{-2 - 3}{-4 - 4} = \frac{-5}{-8} = \frac{5}{8}$
slope of $\overleftrightarrow{LM} = \frac{1 - 6}{-3 - 5} = \frac{-5}{-8} = \frac{5}{8}$
The lines have the same slope, so they are parallel.

29. slope of $\overleftrightarrow{ST} = \frac{3 - 5}{2 - (-4)} = \frac{-2}{6} = -\frac{1}{3}$
slope of $\overleftrightarrow{UV} = \frac{4 - 1}{4 - 3} = 3$
The product of the slopes is $\left(-\frac{1}{3}\right)(3) = -1$, so the lines are perpendicular.

LESSON 3-6

30. $m = \frac{5 - 1}{-3 - 6} = -\frac{4}{9}$
$y - y_1 = m(x - x_1)$
$y - 1 = -\frac{4}{9}(x - 6)$
$y - 1 = -\frac{4}{9}x + \frac{8}{3}$
$y = -\frac{4}{9}x + \frac{11}{3}$

31. $y - y_1 = m(x - x_1)$
$y - (-4) = \frac{2}{3}(x - (-3))$
$y + 4 = \frac{2}{3}(x + 3)$
$y + 4 = \frac{2}{3}x + 2$
$y = \frac{2}{3}x - 2$

32. $m = \frac{-2 - 0}{0 - 1} = \frac{-2}{-1} = 2$
$y - y_1 = m(x - x_1)$
$y - 0 = 2(x - 1)$

33. Solve both equations for y to find the slope-intercept form.

$-3x + 2y = 5$ | $6x - 4y = 8$

$2y = 3x + 5$ | $6x - 8 = 4y$

$y = \frac{3}{2}x + \frac{5}{2}$ | $y = \frac{3}{2}x - 2$

Both lines have a slope of $\frac{3}{2}$, and the y-intercepts are different. So the lines are parallel.

34. Solve the second equation for y to find the slope-intercept form.

$5x + 2y = 1$

$2y = -5x + 1$

$y = -\frac{5}{2}x + \frac{1}{2}$

The lines have different slopes, so they intersect.

35. Solve the second equation for y to find the slope-intercept form.

$2x - y = -1$

$2x + 1 = y$

$y = 2x + 1$

Both lines have a slope of 2 and y-intercept of 1, so they coincide.

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1. Possible answer: plane $ABC \parallel$ plane DEF

2. Possible answer: $\overline{AC} \parallel \overline{DF}$

3. Possible answer: $\overline{AB}$ and $\overline{CF}$ are skew.

4. $3x + 21 = 4x + 9$

$21 = x + 9$

$12 = x$

$3(12) + 21 = 57$

$4(12) + 9 = 57$

Both labeled $\measuredangle$ measure 57°.

5. $26x - 7 = 20x + 17$

$6x - 7 = 17$

$6x = 24$

$x = 4$

$26(4) - 7 = 97$

$20(4) + 17 = 97$

Both labeled $\measuredangle$ measure 97°.

6. $42x - 9 = 35x + 12$

$7x - 9 = 12$

$7x = 21$

$x = 3$

$42(3) - 9 = 117$

$35(3) + 12 = 117$

Both labeled $\measuredangle$ measure 117°.

7. $m\angle 4 = (16x + 20)° = 16(3) + 20 = 68°$

$m\angle 5 = (12x + 32)° = 12(3) + 32 = 68°$

$\angle 4 \cong \angle 5$, so $f \parallel g$ by the Conv. of the Alt. Int. $\measuredangle$ Thm.

8. $m\angle 3 = (18x + 6)° = 18(4) + 6 = 78°$

$m\angle 5 = (21x + 18)° = 21(4) + 18 = 102°$

$m\angle 3 + m\angle 5 = 78° + 102° = 180°$

$\angle 3$ and $\angle 5$ are supp., so $f \parallel g$ by the Conv. of the Same-Side Int. $\measuredangle$ Thm.

9.

Statements	Reasons
1. $\angle 1 \cong \angle 2$, $n \perp \ell$	1. Given
2. $\ell \parallel m$	2. Conv. of the Corr. $\measuredangle$ Post.
3. $n \perp m$	3. $\perp$ Transv. Thm.

10. Substitute $(-3, -4)$ for (x_1, y_1) and $(-1, 3)$ for (x_2, y_2) in the slope formula and then simplify.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - (-4)}{-1 - (-3)} = \frac{7}{2}$$

11. Substitute $(-1, -3)$ for (x_1, y_1) and $(2, -1)$ for (x_2, y_2) in the slope formula and then simplify.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-1 - (-1)}{2 - (-3)} = \frac{0}{5} = 0$$

12. Substitute $(0, -3)$ for (x_1, y_1) and $(5, 1)$ for (x_2, y_2) in the slope formula and then simplify.

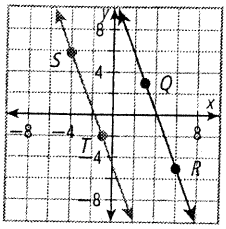
$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - (-3)}{5 - 0} = \frac{4}{5}$$

13. Use the points (9.5, 0) and (14, 32) to graph the line and find the slope.

$$m = \frac{32 - 0}{14 - 9.5} = \frac{32}{4.5} \approx 7.1$$

The slope is about 7.1, which means Greg's average speed was about 7.1 mi/h.

14.



slope of $\overleftrightarrow{QR} = \frac{-5 - 3}{6 - 3} = \frac{-8}{3} = -\frac{8}{3}$

slope of $\overleftrightarrow{ST} = \frac{-2 - 6}{-1 - (-4)} = \frac{-8}{3} = -\frac{8}{3}$

The lines have the same slope, so they are parallel.

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

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

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

16. Solve both equations for y to find the slope-intercept form.

$6x + y = 3$

$y = -6x + 3$

$2x + 3y = 1$

$3y = -2x + 1$

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

The lines have different slopes, so they intersect.