

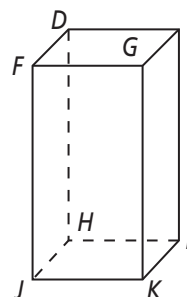
3-1 Standardized Test Prep

Lines and Angles

Multiple Choice

For Exercises 1–7, choose the correct letter.

For Exercises 1–3, use the figure at the right.



1. Which line segment is parallel to \overline{GE} ? **B**

- (A) \overline{DH} (C) \overline{FG}
 (B) \overline{KI} (D) \overline{HI}

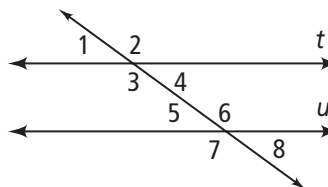
2. Which two line segments are skew? **I**

- (F) \overline{DE} and \overline{GE} (H) \overline{EI} and \overline{GK}
 (G) \overline{GK} and \overline{DH} (I) \overline{HI} and \overline{DF}

3. Which line segment is parallel to plane $FGKJ$? **B**

- (A) \overline{FD} (B) \overline{HI} (C) \overline{GE} (D) \overline{KI}

For Exercises 4–7, use the figure at the right.



4. Which is a pair of alternate interior angles? **F**

- (F) $\angle 3$ and $\angle 6$ (H) $\angle 6$ and $\angle 5$
 (G) $\angle 2$ and $\angle 7$ (I) $\angle 4$ and $\angle 6$

5. Which angle corresponds to $\angle 7$? **B**

- (A) $\angle 1$ (B) $\angle 3$ (C) $\angle 4$ (D) $\angle 6$

6. Which pair of angles are alternate exterior angles? **I**

- (F) $\angle 1$ and $\angle 5$ (G) $\angle 3$ and $\angle 6$ (H) $\angle 5$ and $\angle 8$ (I) $\angle 1$ and $\angle 8$

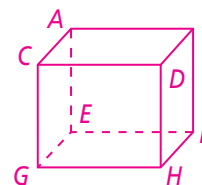
7. Which pair of angles are same-side interior angles? **D**

- (A) $\angle 1$ and $\angle 5$ (B) $\angle 3$ and $\angle 6$ (C) $\angle 4$ and $\angle 8$ (D) $\angle 3$ and $\angle 5$

Short Response

8. Describe the parallel planes, parallel lines, and skew lines in a cube. Draw a sketch to illustrate your answer.

[2] A cube has three sets of parallel planes. Each edge of the cube has three edges that are parallel to it and four edges that are skew in relation to it. [1] unclear/incomplete description or drawing OR one element missing [0] incorrect or no response



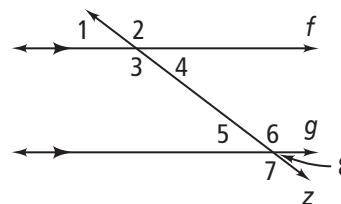
3-2 Standardized Test Prep

Properties of Parallel Lines

Multiple Choice

For Exercises 1–6, choose the correct letter.

For Exercises 1–4, use the figure at the right.



1. Which angle is congruent to $\angle 1$? **B**

(A) $\angle 2$ (C) $\angle 6$

(B) $\angle 5$ (D) $\angle 7$

2. Which angle is not supplementary to $\angle 6$? **F**

(F) $\angle 2$ (G) $\angle 4$ (H) $\angle 5$ (I) $\angle 8$

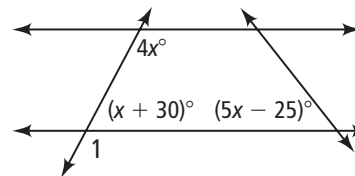
3. Which can be used to prove directly that $\angle 1 \cong \angle 8$? **D**

- (A) Alternate Interior Angles Theorem
- (B) Corresponding Angles Theorem
- (C) Same-Side Interior Angles Postulate
- (D) Alternate Exterior Angles Theorem

4. If $m\angle 5 = 42$, what is $m\angle 4$? **F**

(F) 42 (G) 48 (H) 128 (I) 138

For Exercises 5 and 6, use the figure at the right.



5. What is the value of x ? **C**

(A) 10 (C) 30

(B) 25 (D) 120

6. What is the measure of $\angle 1$? **H**

(F) 45 (G) 60 (H) 120 (I) 125

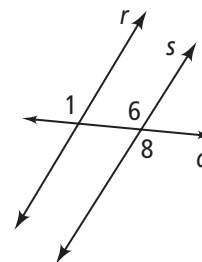
Short Response

7. Write a two-column proof of the Alternate Exterior Angles Theorem (Theorem 3-3).

Given: $r \parallel s$

Prove: $\angle 1 \cong \angle 8$

[2] $r \parallel s$; given; $\angle 1 \cong \angle 6$; if lines are \parallel , then corresp. \angle s are \cong ; $\angle 6 \cong \angle 8$; vert. \angle s are \cong ; $\angle 1 \cong \angle 8$; trans. prop. of \cong . [1] some steps correct [0] proof incorrect or absent



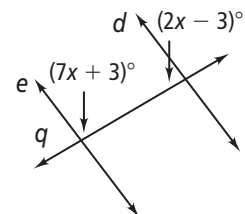
3-3 Standardized Test Prep

Proving Lines Parallel

Multiple Choice

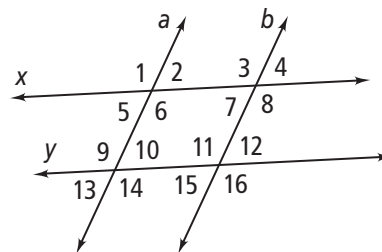
For Exercises 1–6, choose the correct letter.

1. For what value of x is $d \parallel e$? **A**
 (A) 20 (B) 25 (C) 35 (D) 37



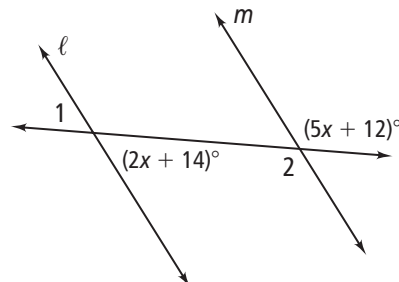
For Exercises 2 and 3, use the figure below right.

2. Which statement proves that $a \parallel b$? **G**
 (F) $\angle 8$ is supplementary to $\angle 12$. (H) $\angle 1 \cong \angle 6$
 (G) $\angle 10$ is supplementary to $\angle 11$. (I) $\angle 5 \cong \angle 13$
3. Which statement proves that $x \parallel y$? **C**
 (A) $\angle 2$ is supplementary to $\angle 3$. (C) $\angle 6 \cong \angle 9$
 (B) $\angle 14$ is supplementary to $\angle 15$. (D) $\angle 12 \cong \angle 13$



For Exercises 4–6, use the figure at the right.

4. If $\ell \parallel m$, what is $m\angle 1$? **G**
 (F) 22 (G) 58 (H) 122 (I) 130
5. For what value of x is $\ell \parallel m$? **A**
 (A) 22 (B) 54 (C) 58 (D) 122
6. If $\ell \parallel m$, what is $m\angle 2$? **H**
 (F) 22 (G) 58 (H) 122 (I) 130

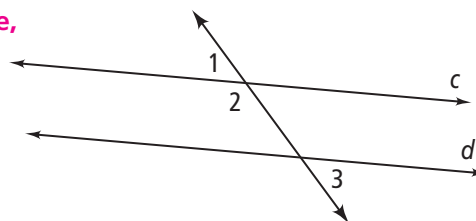


Short Response

7. Write a flow proof. **[1] partly incorrect, incomplete, or disorganized proof**

Given: $\angle 2$ and $\angle 3$ are supplementary.

Prove: $c \parallel d$ **[0] incorrect or no proof [2]**



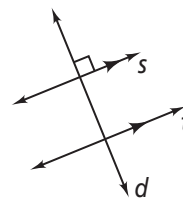
3-4 Standardized Test Prep

Parallel and Perpendicular Lines

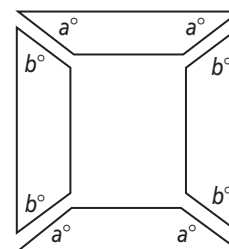
Multiple Choice

For Exercises 1–5, choose the correct letter.

- Which can be used to prove $d \perp t$? **C**
 - (A) Transitive Property of Parallel Lines
 - (B) Transitive Property of Congruence
 - (C) Perpendicular Transversal Theorem
 - (D) Converse of the Corresponding Angles Theorem

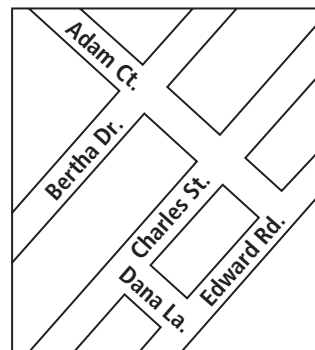


- A carpenter is building a frame. Which values of a and b will ensure that the sides of the finished frame are parallel? **H**
 - (F) $a = 40$ and $b = 60$
 - (G) $a = 45$ and $b = 50$
 - (H) $a = 30$ and $b = 60$
 - (I) $a = 40$ and $b = 40$



For Exercises 3 and 4, use the map at the right.

- If Adam Ct. is perpendicular to Bertha Dr. and Charles St., what must be true? **B**
 - (A) Adam Ct. \perp Edward Rd.
 - (B) Bertha Dr. \parallel Charles St.
 - (C) Adam Ct. \parallel Dana La.
 - (D) Dana La. \perp Charles St.
- Adam Ct. is perpendicular to Charles St. and Charles St. is parallel to Edward Rd. What must be true? **F**
 - (F) Adam Ct. \perp Edward Rd.
 - (G) Adam Ct. \parallel Dana La.
 - (H) Bertha Dr. \parallel Charles St.
 - (I) Dana La. \perp Charles St.



- If $a \perp b$, $b \perp c$, $c \parallel d$, and $d \perp e$, which is not true? **D**
 - (A) $a \perp e$
 - (B) $a \parallel c$
 - (C) $a \parallel d$
 - (D) $b \parallel d$

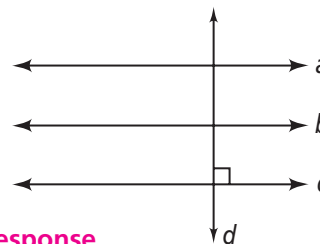
Short Response

- Write a paragraph proof.

Given: $a \parallel b$, $b \parallel c$, and $d \perp c$

Prove: $a \perp d$

[2] It is given that $a \parallel b$ and $b \parallel c$, so by the Transitive Property of Parallel Lines, $a \parallel c$. It is given that $d \perp c$. Then, by the Perpendicular Transversal Theorem, $a \perp d$.
[1] one step incorrect or incomplete [0] incorrect or no response



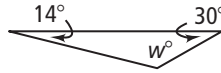
3-5

Standardized Test Prep

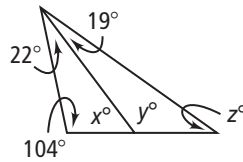
Parallel Lines and Triangles

Gridded Response

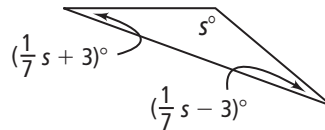
1. What is the value of w ?



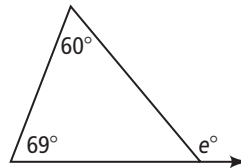
2. What is the value of z ?



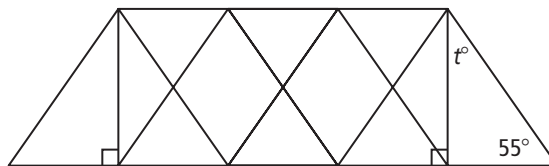
3. What is the value of s ?



4. What is the value of e ?



5. What is the value of t on the truss of the bridge?



Answers

1. **1 3 6**

-	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9

2. **3 5**

-	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9

3. **1 4 0**

-	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9

4. **1 2 9**

-	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9

5. **3 5**

-	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9

3-7

Standardized Test Prep

Equations of Lines in the Coordinate Plane

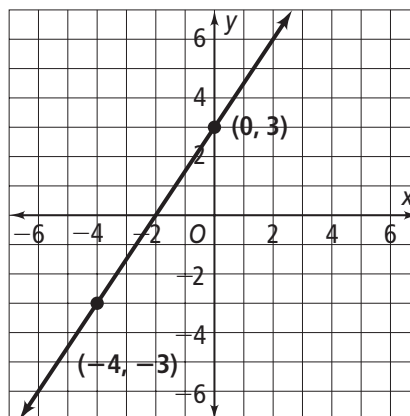
Multiple Choice

For Exercises 1-4, choose the correct letter.

1. What is the slope of the line passing through the points (2, 7) and (-1, 3)? **C**
- (A) $\frac{2}{7}$ (B) $\frac{3}{4}$ (C) $\frac{4}{3}$ (D) $\frac{1}{3}$

2. What is the correct equation of the line shown at the right? **F**

- (F) $y = \frac{3}{2}x + 3$ (H) $y = \frac{2}{3}x + 3$
- (G) $y = -\frac{3}{2}x - 3$ (I) $y = -\frac{2}{3}x - 3$



3. The x -intercept of a line is -5 and the y -intercept of the line is -2 . What is the equation of the line? **D**

- (A) $y = -\frac{5}{2}x - 3$ (C) $y = -\frac{5}{2}x - 2$
- (B) $y = \frac{2}{5}x + 2$ (D) $y = -\frac{2}{5}x - 2$

4. What is the slope-intercept form of the equation $y - 7 = -\frac{5}{2}(x + 4)$? **I**

- (F) $y - 2 = -\frac{5}{2}(x + 2)$ (H) $y = -\frac{4}{7}x + 2$
- (G) $y + 7 = -x + \frac{5}{2}$ (I) $y = -\frac{5}{2}x - 3$

Short Response

5. **Error Analysis** A student has attempted to graph an equation that contains the point (1, -4) and has a slope of $\frac{1}{3}$.

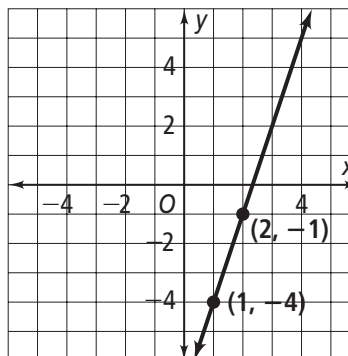
a. What is the correct equation in slope-intercept form?

b. What is the student's error on the graph?

[2] $y = \frac{1}{3}x - 4\frac{1}{3}$; the student uses the wrong slope in the graph. The student's line has a slope of 3.

[1] wrong equation or incomplete explanation

[0] incorrect or no response



3-8 Standardized Test Prep

Slopes of Parallel and Perpendicular Lines

Multiple Choice

For Exercises 1-4 choose the correct letter.

1. Which pair of slopes could represent perpendicular lines? **C**

(A) $\frac{1}{7}, 7$

(B) $\frac{1}{2}, \frac{2}{4}$

(C) $-\frac{3}{4}, \frac{4}{3}$

(D) $\frac{1}{3}, \frac{1}{3}$

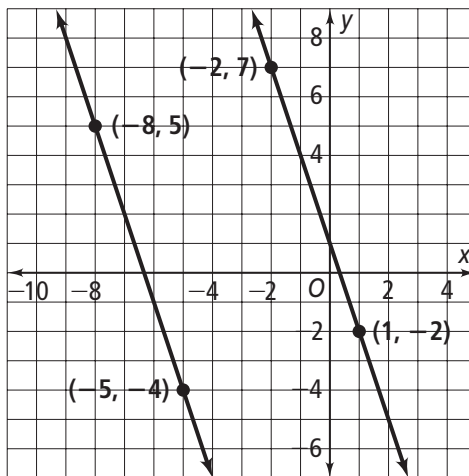
2. The lines shown in the figure at the right are **F**

(F) parallel.

(G) perpendicular.

(H) neither parallel nor perpendicular.

(I) both parallel and perpendicular.



3. Two lines are perpendicular when **A**

(A) the product of their slopes is -1 .

(B) the product of their slopes is greater than 0.

(C) they have the same slope.

(D) their slopes are undefined.

4. Which is the equation for the line perpendicular to $y = -\frac{5}{3}x + 11\frac{1}{3}$ and containing $P(-2, 3)$? **I**

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

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

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

(I) $y = \frac{3}{5}x + 4\frac{1}{5}$

Extended Response

5. Graph the vertices of $ABCD$ where $A(-1, 3)$, $B(-6, -2)$, $C(-1, -7)$, and $D(4, -2)$.

a. Explain how you know the opposite sides of $ABCD$ are parallel.

They have the same slopes.

b. Explain how you know the adjacent sides of $ABCD$ are perpendicular.

The product of their slopes is -1 .

c. What is the length of each side, to the nearest inch, if each grid space is equal to 2 in.?

14 in.

d. What kind of figure is $ABCD$?

a square; [4] four answers correct

[3] three correct [2] two correct

[1] one correct [0] no answers correct

