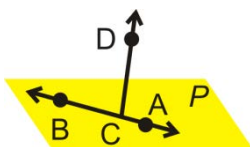


1.1 Basic Geometric Definitions

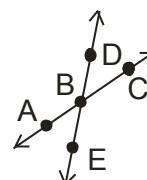
Answers

Possible Answers for 1-4. Answers may vary.

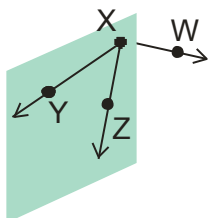
1.



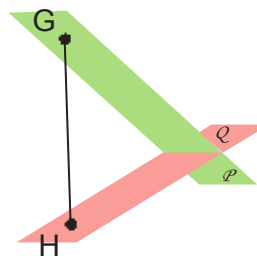
2.



3.



4.



5. This problem describes any quadrilateral with the diagonals drawn in.

6. $\overleftrightarrow{WX}, \overleftrightarrow{XW}, \overleftrightarrow{WY}, \overleftrightarrow{YW}, \overleftrightarrow{XY}, \overleftrightarrow{YX}$ and line m .

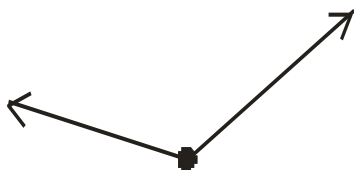
7. $\overleftrightarrow{TR}, \overleftrightarrow{TS}, \overleftrightarrow{RT}$, and \overleftrightarrow{ST} .

8. Plane V, Plane RST, Plane RTS, Plane STR, Plane SRT, Plane TSR, and Plane TRS.

9. A soccer field is like a plane since it is a flat two-dimensional surface. Student could also say it is a rectangle.
10. **Possible Answers** sun rays, laser beam, the hands on a clock, foul lines on a baseball field, the light from a flashlight.
11. A line and a plane intersect at a point.
12. A postulate is assumed true and a theorem must be proven true. All postulates, by definition, are true. You must be told (or shown in a proof) that a theorem is true *before* you can use it in a proof or otherwise.
13. **Possible Answer** \overrightarrow{PQ} intersects \overleftrightarrow{RS} at point Q.
14. **Possible Answer** \overrightarrow{AC} and \overline{AB} are coplanar but point D is not.
15. **Possible Answers** Points E and H lie in Plane J, but \overrightarrow{EF} and \overrightarrow{HG} do not. Points E and H are coplanar, but \overrightarrow{EF} and \overrightarrow{HG} are non-coplanar.
16. **Possible Answer** \overrightarrow{IM} , \overrightarrow{IL} , \overrightarrow{IK} , and \overrightarrow{IJ} have I as the endpoint, but J, K, L and M are *non-collinear*.
17. True.

18. False. To make this a true statement, it should say *three non-collinear points determine a plane*. If three points are collinear, then they can be in infinitely many planes.

19. False. See the picture.

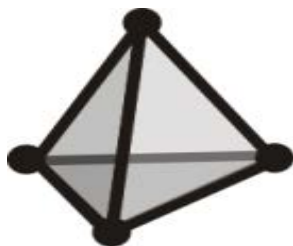


20. False. To make this a true statement, it should say *a line segment is the set of infinitely many collinear points between two endpoints*.

21. False, by definition a point is “zero dimensional” and does not take up space.

22. True.

23. False. See the picture.



24. False, the endpoint, A, must be first.

25. True.

1.2 Distance Between Two Points

Answers

For questions 1-8, your answers may vary, depending on the size of paper you printed these questions on. These answers are for 100% on a 8.5" x 11" piece of paper.

1. 2.75 in

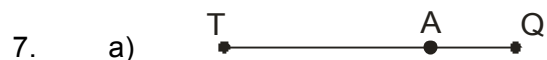
2. 4.9 cm

3. 4.125 in

4. 8.2 cm



6. O is the midpoint. $LO = OT = 8$ cm.



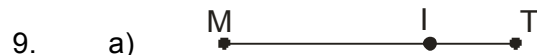
b) $TA + AQ = TQ$

c) $TQ = 15$ in



b) $HM + MA = HA$

c) $MA = 11$ cm



b) $MI + IT = MT$

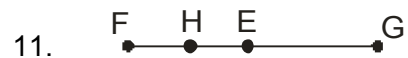
c) $MI = 19$ cm



$BC = 8$ cm, $BD = 25$ cm, $CD = 17$ cm

Chapter 1 – Basics of Geometry

Answer Key



FE = 8 in, 13 in = HG, FG = 17 in

12. $x = 3$, HJ = 21 units, JK = 12

13. $x = 11$, HJ = 52 units, JK = 79 units

14. 13 units

15. 5 units

16. 9 units

17. 5 units



19. SV = 6 units, TS = 23 units, RS = 17 units, TV = 29 units

20. $x = 3$

1.3 Congruent Angles and Angle Bisectors

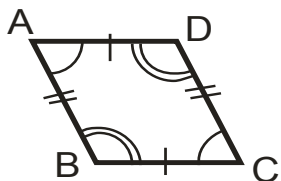
Answers

1. \overline{PS}
2. 90°
3. 45°
4. 45°
5. $x = 20^\circ$
6. $x = 14^\circ$
7. True
8. False
9. False; it divides an angle into two congruent angles.
10. True

1.4 Midpoints and Segment Bisectors

Answers

1. (students may not have angle markings)

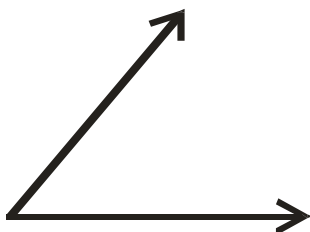


2. \overline{VS} and \overline{QT}
3. \overline{VS} bisects \overline{QT}
4. \overline{QT} bisects \overline{VS} You could also say that the lines bisect each other from what we know in #3.
5. $x = 12$
6. $(3, -5)$
7. $(1.5, -6)$
8. $(5, 5)$
9. $(-4.5, 2)$
10. $(-0.5, -2)$
11. B is $(7, 10)$
12. A is $(6, 9)$

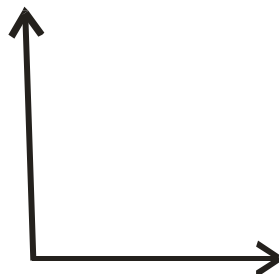
1.5 Angle Measurement

Answers

1. $m\angle LMN = 32^\circ$
2. $x = 15^\circ$
3. False, B is the vertex.
4. True
5. True
6. False, it is equal to the sum of the smaller angles *within* it.
- 7.



8.



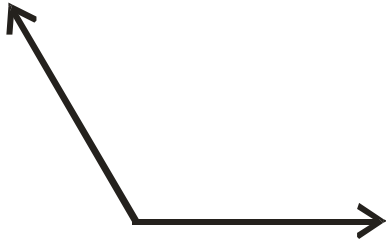
9.



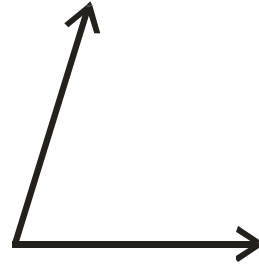
10.



11.



12.



For questions 13-16, student answers might be off by 1° or 2° .

13. 40°

14. 122°

15. 18°

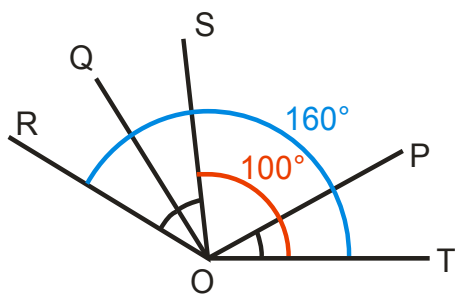
16. 87°

17. $x = 10^\circ$

1.6 Angle Classification

Answers

- False, two angles could be 5° and 30° .
- False, it is a straight angle.
- True
- True
- Acute
- Obtuse
- Obtuse
- Acute
- Obtuse
- Acute
- Possible Answer**



- $m\angle QOP = 100^\circ$
- $m\angle QOT = 130^\circ$
- $m\angle ROQ = 30^\circ$
- $m\angle SOP = 70^\circ$

1.7 Complementary Angles

Answers

1. 86°
2. 1°
3. 36°
4. 58°
5. 63°
6. $90^\circ - (x + y)^\circ$
7. $90^\circ - z^\circ$ or $(90 - z)^\circ$
8. $\angle INJ$ and $\angle KNJ$
9. $m\angle KNJ = 27^\circ$
10. False, they add up to 90°
11. False, they can be the sum of any two angles where their sum is 90° .

1.8 Supplementary Angles

Answers

1. 66°
2. 169°
3. 89°
4. 96°
5. 123°
6. $180^\circ - x^\circ$ or $(180 - x)^\circ$
7. $180^\circ - (x + y)^\circ$
8. **Possible Answer** $\angle JNI$ and $\angle INM$
9. 117°
10. True
11. $x = 17^\circ$
12. $x = 10.5^\circ$

1.9 Linear Pairs

Answers

1. False, they are supplementary.
2. True
3. False, they are next to each other.
4. True
5. False, they *can* form linear pairs, but not all the time.
6. $x = 34^\circ$
7. 119°
8. 147°
9. 66°
10. 173°
11. 1°
12. $180^\circ - z^\circ$ or $(180 - z)^\circ$

1.10 Vertical Angles

Answers

1. Possible Answer $\angle INJ$ and $\angle MNL$
2. $m\angle MNL = 63^\circ$
3. True
4. 64°
5. 42°
6. 27°
7. 21°
8. 32°
9. 4°
10. 21°

1.11 Triangle Classification

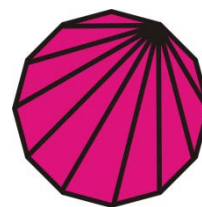
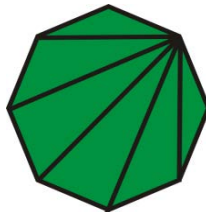
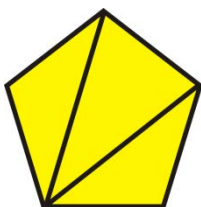
Answers

1. Acute scalene
2. Equiangular equilateral
3. Right isosceles
4. Obtuse scalene
5. Acute isosceles
6. Obtuse isosceles
7. No, because a right angle is 90° and an obtuse angle is greater than 90° . That would be a sum greater than 180° and a triangle's three angles must add up to exactly 180° .
8. No, same reasoning as #7. Two obtuse angles would add up to be greater than 180° .
9. True.
10. False, triangles are named after the largest angle.

1.12 Polygon Classification

Answers

1. Concave pentagon
2. Convex octagon
3. Convex 17-gon
4. Convex decagon
5. Concave quadrilateral
6. Concave hexagon.
7. A is not a polygon because two of the sides do not meet at a vertex; B is not a polygon because one side is curved; C is not a polygon because it is not closed.
8. 2 diagonals
9. 5 diagonals
10. 9 diagonals



11. Nonagon: 21, Decagon: 35, Undecagon: 44, Dodecagon: 54
12. True
13. False, a star is a concave polygon.
14. True, see the picture.

