MAT 307: Exam 2
Spring – 2023
04/17/2023
85 Minutes

Name: *Caleb M^{c}Whorter — Solutions*

Write your name on the appropriate line on the exam cover sheet. This exam contains 9 pages (including this cover page) and 30 questions. Check that you have every page of the exam. Indicate your answer for each question in the answer column in the table below. You need not indicate your answers for each question both on the cover page and in the subsequent pages. You may show as much or as little work as you would like; however, only the answers on this cover page will be graded. Be sure each answer is legible and in the correct box. Do not write in the 'Points' box on this page.

Question	Answer	Question	Answer	Question	Answer
1	b	11	d	21	c
2	b	12	b	22	b
3	a	13	d	23	a
4	b	14	c	24	d
5	a	15	a	25	a
6	b	16	c	26	b
7	b	17	d	27	a
8	c	18	c	28	c
9	b	19	d	29	b
10	c	20	b	30	b

Points	Total
	30

1. If lines ℓ_1 and ℓ_2 are parallel and ℓ_3 is not parallel to ℓ_1, which of the following is true.

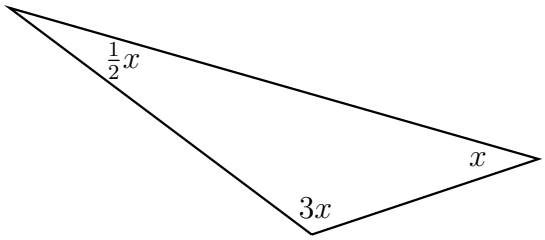
   A. ℓ_3 is parallel to ℓ_2.

   B. ℓ_3 intersects ℓ_2.

   C. ℓ_3 is concurrent to ℓ_1 and ℓ_2.

   D. ℓ_3 cannot be a transversal to ℓ_1 and ℓ_2.

2. What is the value of the angle x in the triangle below?



   A. $30°$

   B. $40°$

   C. $80°$

   D. $120°$

3. How many degrees does the hour hand of a clock move in 40 minutes?

   A. $20°$

   B. $30°$

   C. $40°$

   D. $240°$

4. What angle is formed using the minute and hour hand of a clock at 4:30?

   A. $30°$

   B. $45°$

   C. $120°$

   D. $135°$

5. When measured from the positive x-axis (the initial side), which of the following angle has the same as terminal side as the angle $120°$?

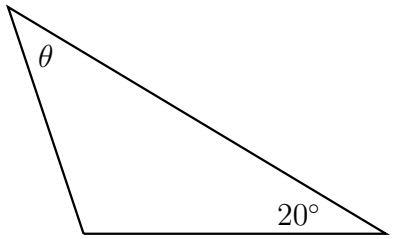
   A. $-240°$

   B. $-60°$

   C. $60°$

   D. $240°$

6. If the triangle below has whole number angles and is drawn to scale, which of the following is the largest possible measure for the angle θ?



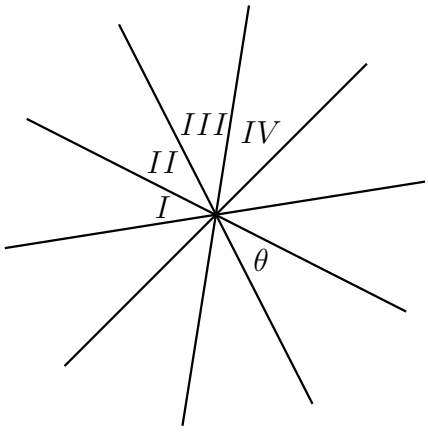
   A. $20°$

   B. $69°$

   C. $70°$

   D. $90°$

7. Which of the following angles is vertical to angle θ in the diagram below?



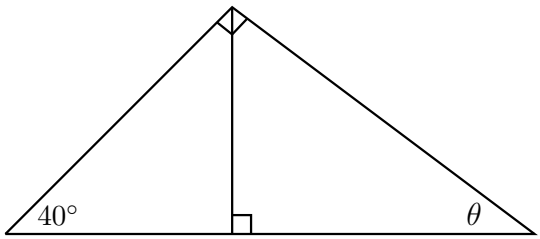
   A. I

   B. II

   C. III

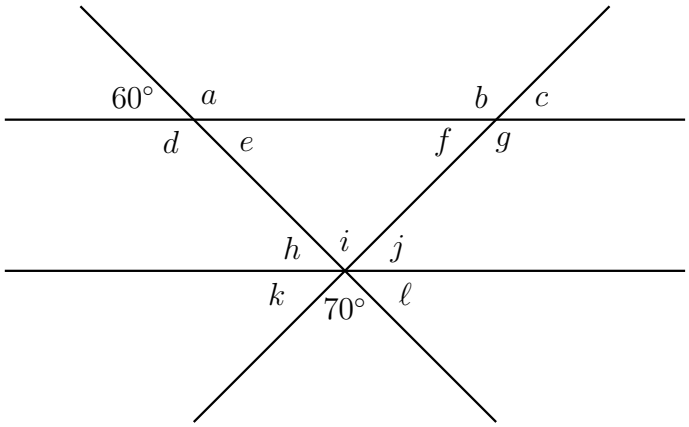
   D. IV

8. What is the measure of the angle θ in the triangle below?



A. $40°$
B. $45°$
C. $50°$
D. $60°$

9. What is the measure of angle f in the diagram below?

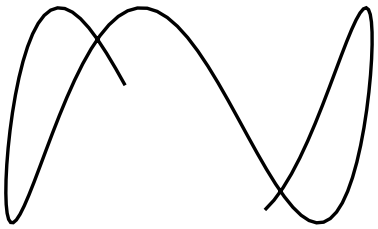


A. $40°$
B. $50°$
C. $60°$
D. $70°$

10. Which of the following *does not* force two lines cut by a transversal to be parallel?

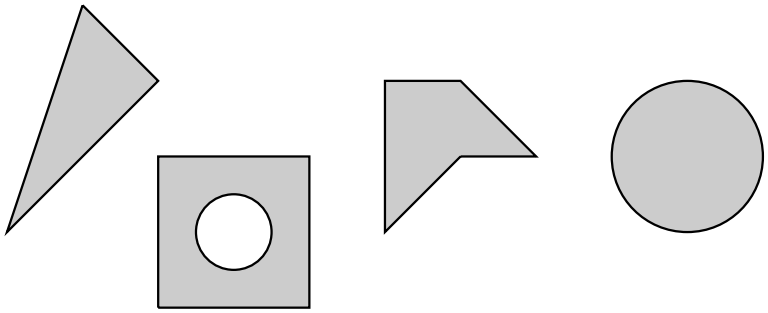
A. The alternate interior angles are congruent.
B. The corresponding angles are congruent.
C. The vertical angles are congruent.
D. The alternate exterior angles are congruent.

11. Which of the following best describes the curve shown below?



A. A simple curve.
B. A closed curve.
C. A simple, closed curve.
D. A non-simple, curve.

12. How many convex figures are shown below?



A. 1
B. 2
C. 3
D. 4

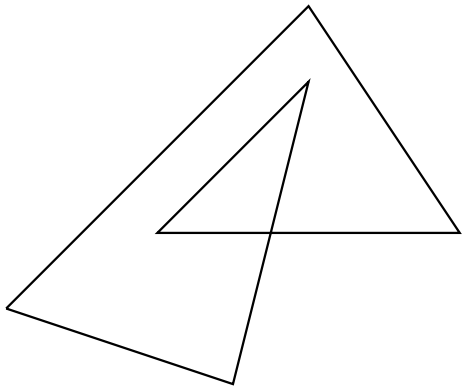
13. Which of the following cannot be the sum of the interior angles of a convex n-gon?

A. $180°$
B. $360°$
C. $1260°$
D. $2250°$

14. Which of the following cannot be the measure of an interior angle of a regular polygon?

    A. 60°
    B. 90°
    C. 158°
    D. 168°

15. Find the total turn for the closed curve shown below if one traverses the curve clockwise.



    A. -720°
    B. -360°
    C. 0°
    D. 360°

16. Which of the following statements is *true*?

    A. All rectangles are rhombuses.
    B. All rhombuses are rectangles.
    C. Some rhombuses are rectangles.
    D. There are no rectangles that are rhombuses.

17. Which of the following statements is *false*?

    A. Rectangles are isosceles trapezoids.
    B. There are no squares that are not also a rhombus.
    C. Triangles are never parallelograms.
    D. A trapezoid can never be a parallelogram.

18. A convex, five-sided polygon has angles $110°$, $90°$, $120°$, and $100°$. Find the measure of the missing angle.

    A. $90°$
    B. $100°$
    C. $120°$
    D. $160°$

19. Which of the following is *true*?

    A. The total turn around any polygon is $360°$.
    B. All n-gons have interior angles whose sum is $(n-2)180°$.
    C. The sum of the exterior angles to a nonagon is $1260°$.
    D. A general polygon can have sides which intersect at a point other than their endpoints.

20. What is the measure of the interior angles of a regular octagon?

    A. $45°$
    B. $135°$
    C. $1080°$
    D. $1440°$

21. Which of the following statements is *true*.

    A. The interior angles of a regular n-gon are always greater than their exterior angles.
    B. The exterior angles of a regular n-gon are always greater than their interior angles.
    C. The interior angles of a regular n-gon are almost always greater than their exterior angles.
    D. The interior and exterior angles of a regular n-gon are never congruent.

22. Which of the following are sometimes a regular n-gon?

    A. A circle.
    B. A rectangle.
    C. A figure eight.
    D. A non-isosceles trapezoid.

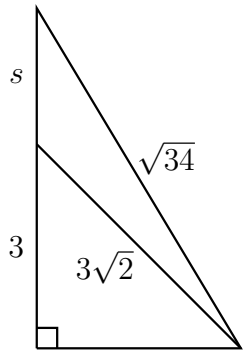
23. Aleksandr is reading about US History. He reads that George Washington only made \$2.50 every fortnight. How much is this in euro per week? [1 fortnight $=$ 2 weeks; €1 $=$ \$1.10]

    A. €1.14 per week
    B. €1.38 per week
    C. €2.55 per week
    D. €4.54 per week

24. A large circular room is 15 ft across. What is the area of this room in square inches?

    A. 58.9 in^2
    B. 706.9 in^2
    C. 2,120.6 in^2
    D. 25,446.9 in^2

25. Find s in the diagram below:



    A. 2
    B. 3
    C. 8
    D. 12

26. What is the volume of a can of soda if the can is approximately a right circular cylinder with height 4.8 in and is 2.6 in across?

    A. 19.6 in^3
    B. 25.5 in^3
    C. 39.2 in^3
    D. 123.2 in^3

27. You are wrapping a large holiday gift for a friend. The box is oddly (but regularly shaped) at the base but you estimate the base has area 7.34 ft^2 and perimeter 15.5 ft. The box narrows to a point at the top and is generally shaped like a pyramid. The slanted height of the entire box is 3.5 ft. What is approximately the least amount of wrapping paper it will take to cover the gift?

    A. 34.5 ft^3

    B. 41.2 ft^3

    C. 96.2 ft^3

    D. 398.2 ft^3

28. You want to paint a small wood working box that you made. The box has a rectangular base that measure 1.5 ft by 3.6 ft. The box is open at the top and is 0.75 ft tall. What is the surface area of the box?

    A. 4.05 ft^2

    B. 5.85 ft^2

    C. 13.05 ft^2

    D. 18.45 ft^2

29. What is the volume of a cone that is 10 cm tall and whose base is a circle that measures 5 cm across?

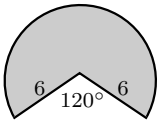
    A. 52.4 cm^3

    B. 65.4 cm^3

    C. 261.8 cm^3

    D. 785.4 cm^3

30. What is the area of the region shaded below?



    A. 0.94

    B. 75.4

    C. 37.7

    D. 233.1