CCSS INTEGRATED PATHWAY: MATHEMATICS II
End-of-Course Assessment

Assessment

End-of-Course Assessment

Technology Enhanced

Circle the letter of the best answer.

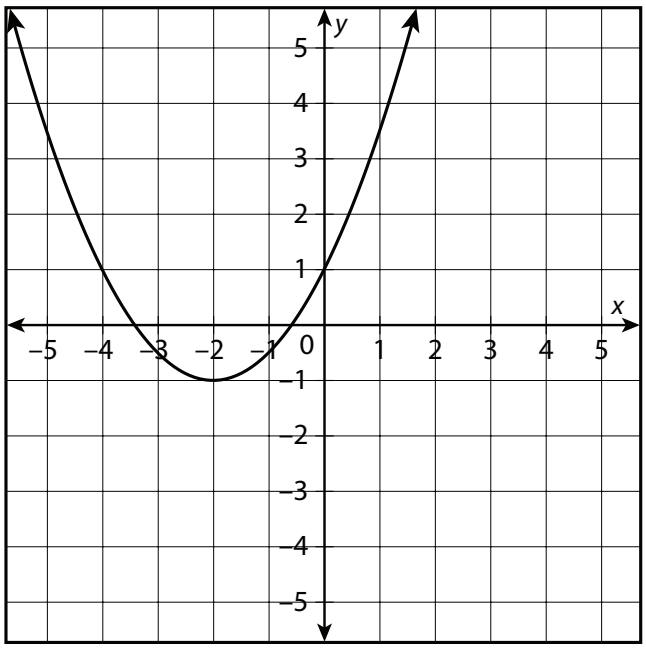
1. What is the product of $3x^2 + 2x - 6$ and $5 - 5x$?

   a. $15x^3 - 5x^2 - 40x + 30$
   b. $15x^3 + 25x^2 - 40x + 30$
   c. $-15x^3 + 5x^2 + 40x - 30$
   d. $-15x^3 - 25x^2 + 40x - 30$

2. Simplify the expression $(3 + 2i)(4 - 5i) - (7 + 6i)$.

   a. $15 - i$
   b. $15 - 13i$
   c. $29 - 13i$
   d. $29 - i$

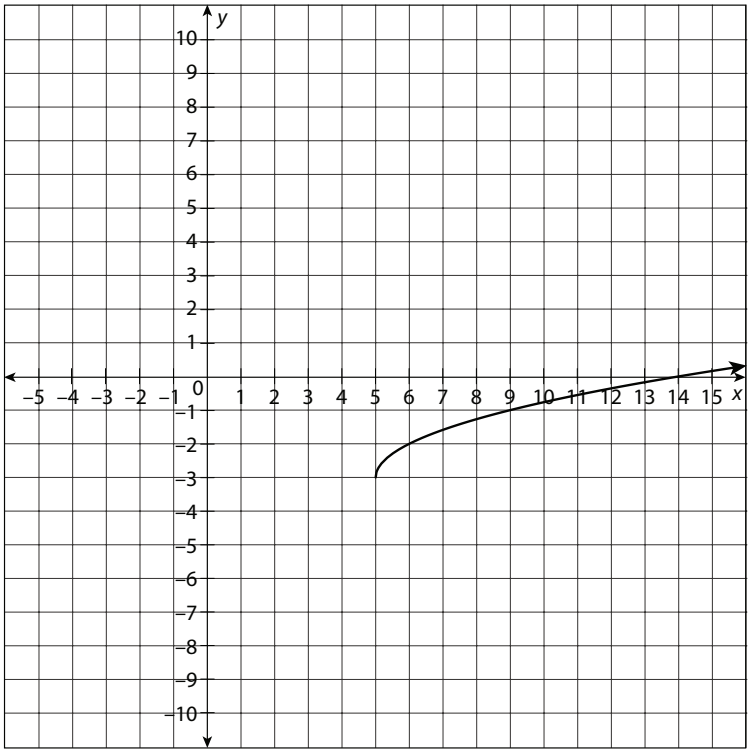
3. Which function matches the following graph?



   a. $f(x) = \frac{1}{2}(x + 2)^2 - 1$
   b. $f(x) = -\frac{1}{2}(x + 2)^2 - 1$
   c. $f(x) = (x - 2)^2 - 1$
   d. $f(x) = (x + 2)^2 - 1$

continued

4. Which function matches the following graph?



a. $f(x) = \sqrt{x-5} - 3$

b. $f(x) = \sqrt{x+5} - 3$

c. $f(x) = (x-3)^2 + 5$

d. $f(x) = (x+5)^2 - 3$

5. What is the percent rate of change of y for each unit of x of the function $y = 500(1.25)^x$?

a. 25% decay

b. 25% growth

c. 75% decay

d. 75% growth

6. Let $f(x) = x^2 - 2$, and suppose $g(x)$ is a straight line passing through (0, 4) with slope equal to 1. Which has a greater y-intercept?

a. $f(x)$

b. $g(x)$

c. The intercepts are equal.

d. There is not enough information to determine which is greater.

continued

7. The function $h(x) = x^2 + 5x$ is the sum of two functions. One of the functions is $g(x) = x^2$. What is the other function?

   a. $f(x) = x$
   b. $f(x) = 5x$
   c. $f(x) = x - 5$
   d. $f(x) = x + 5$

8. Several transformations have been applied to the function $f(x) = x^2$ to obtain the function $g(x) = \frac{1}{3}(x+2)^2 - 3$. What are they?

   a. Stretched vertically by a factor of 3, shifted left 2 units, shifted up 3 units
   b. Compressed vertically by a factor of 1/3, shifted right 2 units, shifted up 3 units
   c. Stretched vertically by a factor of 1/3, shifted right 2 units, shifted down 3 units
   d. Compressed vertically by a factor of 1/3, shifted left 2 units, shifted down 3 units

9. Which function is the inverse of $f(x) = x^2 - 5$ if the domain is $x \leq 0$?

   a. $f^{-1}(x) = \sqrt{x+5}$
   b. $f^{-1}(x) = \sqrt{x-5}$
   c. $f^{-1}(x) = -\sqrt{x+5}$
   d. $f^{-1}(x) = -\sqrt{x-5}$

10. Solve $x^2 - 7x + 12 = 0$ for x.

    a. $x = -3$ and $x = -4$
    b. $x = 3$ and $x = 4$
    c. $x = 6$
    d. $x = 7 + \sqrt{2}$ and $x = 7 - \sqrt{2}$

11. Rewrite the function $f(x) = 2x^2 + 4x - 6$ in factored form. What are the zeros of this function?

    a. 1 and –3
    b. 2 and –2
    c. 3 and –1
    d. 3 and 1

12. What are the solutions to the equation $2x^2 - 5x + 4 = 0$?

    a. $\frac{5 + \sqrt{7}i}{4}$ and $\frac{5 - \sqrt{7}i}{4}$
    b. $\frac{5 \pm 7i}{2}$
    c. 1 and 4
    d. There are no solutions.

continued

13. What are the solutions to the equation $3x^2 + 2x - 2 = -5$?

a. $x = \dfrac{1 \pm i\sqrt{2}}{3}$

b. $x = \dfrac{-1 \pm 2\sqrt{2}}{3}$

c. $x = \dfrac{-1 \pm 2i\sqrt{2}}{3}$

d. $x = \dfrac{-1 \pm i\sqrt{2}}{4}$

14. Identify the vertical asymptote(s) of the function $f(x) = \dfrac{-3}{x - 5}$.

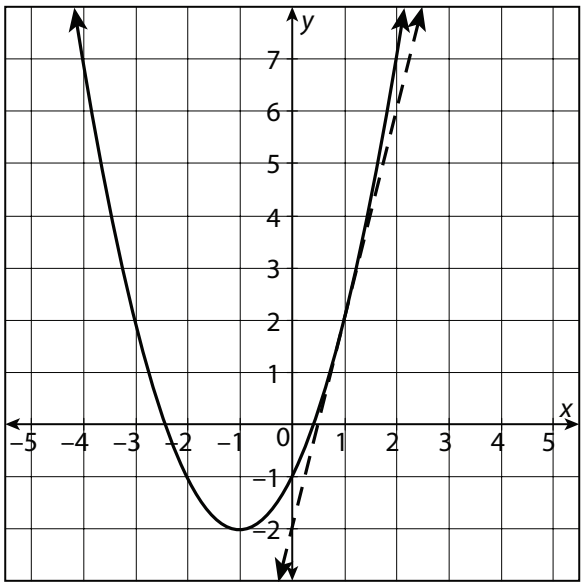
a. $x = 3$

b. $x = -3$

c. $x = -5, 3$

d. $x = 5$

15. Use the graph to determine the real solution(s) to the system of equations, if any exist.



a. There are two real solutions at (–1, –6) and (1, 2).

b. There is exactly one real solution at (–1, –6).

c. There is exactly one real solution at (1, 2).

d. There are no real solutions.

continued

16. The probability that Arthur will get an A on his test is 0.14. The probability that Shauqoria will get an A on her test is 0.23. The probability that both will get an A is 0.07. What is the probability that either Arthur or Shauqoria will get an A on the test, but not both?

a. 0.02
b. 0.07
c. 0.23
d. 0.30

17. A pair of dice is rolled twice. What is the probability that the sum is 9 both times?

a. $\frac{2}{9}$
b. $\frac{1}{6}$
c. $\frac{1}{81}$
d. $\frac{1}{9}$

18. The probability that Eunmi studies and passes her test is $\frac{17}{20}$. The probability that Eunmi studies is $\frac{15}{16}$. What is the probability that Eunmi passes her test, given that she has studied?

a. $\frac{68}{75}$
b. $\frac{51}{64}$
c. $\frac{143}{80}$
d. $\frac{75}{68}$

19. Juan surveyed 500 students in his school to find out their favorite movie genre. His results are as follows.

	Horror	Sci-Fi	Action	Sports	Comedy	Other	Total
Boys	70	45	40	35	25	10	**225**
Girls	50	15	30	15	85	80	**275**
Total	**120**	**60**	**70**	**50**	**110**	**90**	**500**

What is the probability that a randomly chosen person is a girl, given that the person likes comedies?

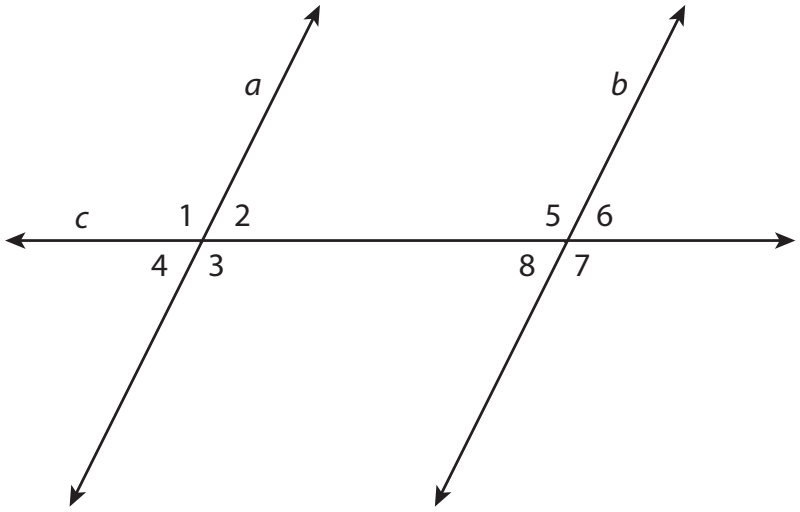
a. $\frac{17}{55}$
b. $\frac{17}{22}$
c. $\frac{17}{100}$
d. $\frac{11}{50}$

continued

20. Given A (3, 8) and B (15, –4), find the point, C, that lies 1/3 of the way from A on the segment $\overline{AB}$.

    a. (7, 4)
    b. (9, 2)
    c. (6, –6)
    d. (11, 0)

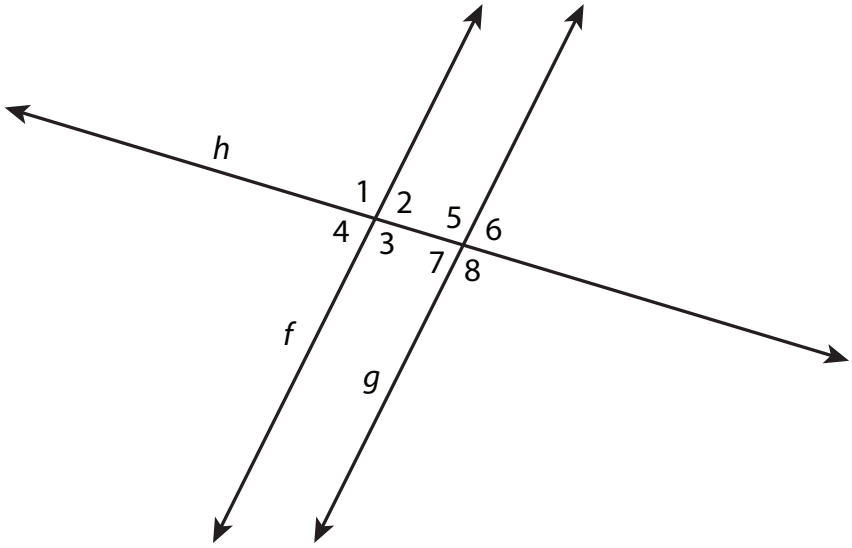
21. Which justifications prove that line a is parallel to line b, given that they are crossed by transversal line c?



    a. Given $\angle 1 \cong \angle 3$, $a \parallel b$ by the Vertical Angles Theorem.
    b. Given $\angle 2 \cong \angle 8$, $a \parallel b$ by the Converse of the Alternate Exterior Angles Theorem.
    c. Given $\angle 1 \cong \angle 5$, $a \parallel b$ by the Converse of the Corresponding Angles Postulate.
    d. Given $\angle 2 \cong \angle 5$, $a \parallel b$ by the Converse of the Consecutive Interior Angles Theorem.

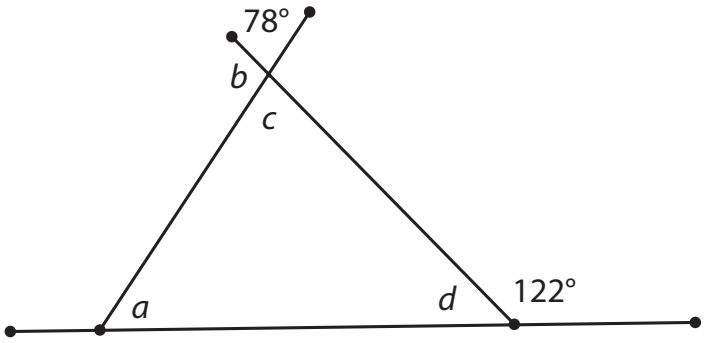
continued

22. Line f and line g are parallel, and are cut by transversal line h. If $m\angle 4 = 3x + 4$ and $m\angle 5 = 11x + 8$, what is $m\angle 5$?



a. 140°
b. 60°
c. 12°
d. 40°

23. Find the measure of each angle.



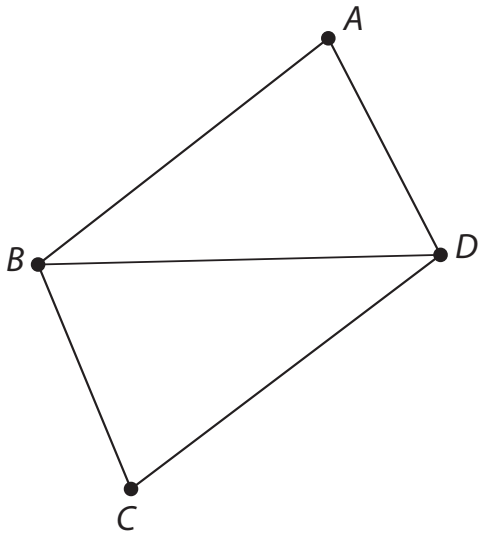
a. $m\angle a = 78°$; $m\angle b = 102°$; $m\angle c = 58°$; $m\angle d = 28°$
b. $m\angle a = 44°$; $m\angle b = 12°$; $m\angle c = 78°$; $m\angle d = 28°$
c. $m\angle a = 44°$; $m\angle b = 102°$; $m\angle c = 78°$; $m\angle d = 58°$
d. $m\angle a = 58°$; $m\angle b = 102°$; $m\angle c = 58°$; $m\angle d = 78°$

continued

24. Use the given figure to justify the last two steps of the proof.

Given: $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \cong \overline{AD}$

Prove: $\triangle ABC \cong \triangle CDB$



Proof:

Statements	Reasons
1. $\overline{AB} \cong \overline{CD}$	Given
2. $\overline{BC} \cong \overline{AD}$	Given
3. $\overline{BD} \cong \overline{DB}$	
4. $\triangle ABC \cong \triangle CDB$	

a. Reflexive Property; Symmetric Property

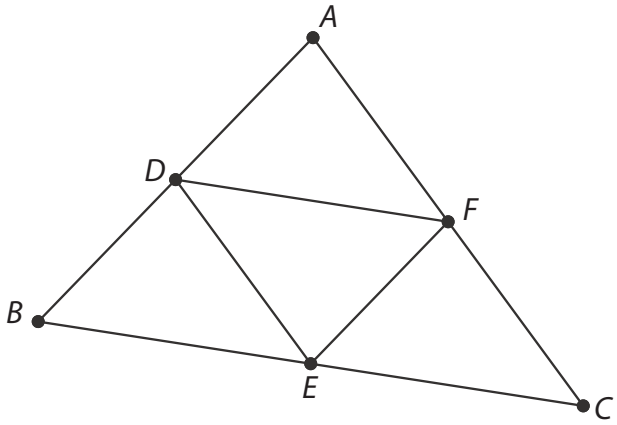
b. Reflexive Property; SSS

c. Symmetric Property; Reflexive Property

d. Symmetric Property; SSS

continued

25. In the following diagram, $\overline{DE}$, $\overline{EF}$, and $\overline{DF}$ are mid-segments of $\triangle ABC$.



An expression for the perimeter of $\triangle DEF$ is:

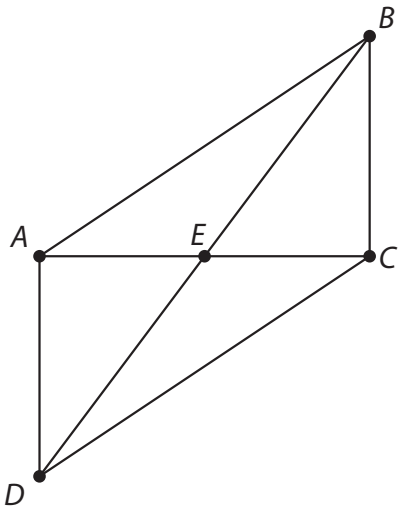
a. $BE + EC + DF$

b. $\frac{1}{2}(AB + BC + CA)$

c. $2(AB + BC + CA)$

d. $\frac{1}{2}AB + \frac{1}{2}BC + CA$

26. Quadrilateral $ABCD$ is a parallelogram; $CE = y + 9$, $BE = 2x$, $AE = 3y - 7$, and $DE = x + 5$. Find x and y.



a. $x = \frac{5}{3}, y = 4$

b. $x = 5,\ y = \frac{2}{3}$

c. $x = 8, y = 5$

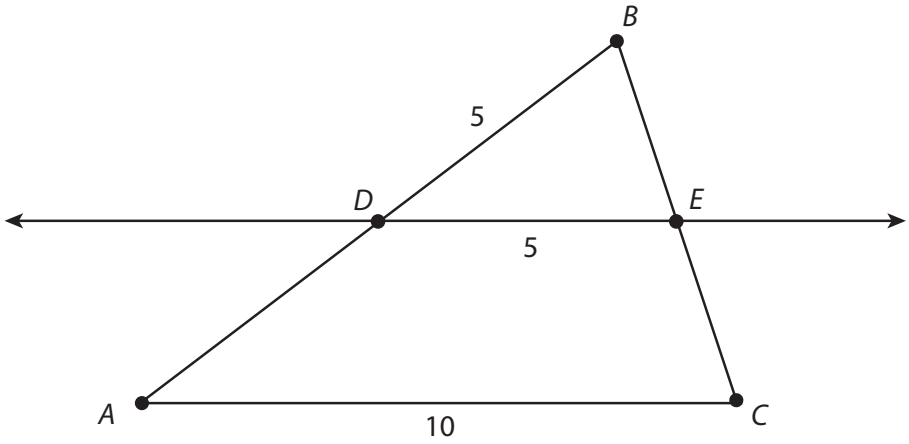
d. $x = 5, y = 8$

continued

27. Line f has the equation $y = 6 - x$. If a dilation with a scale factor of 0.75 and center $A(7, 3)$ is applied, which statements are true?

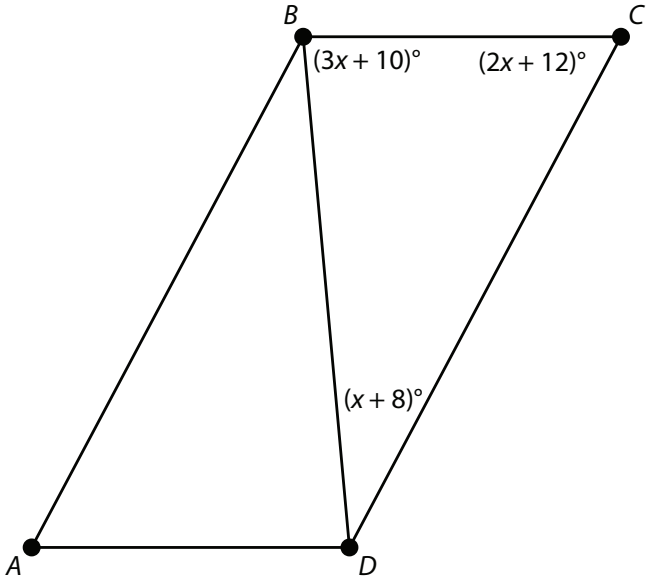
    a. The slope will be the same.
    b. The slope will be perpendicular.
    c. The y-intercept will be the same.
    d. The x-intercept will be the same.

28. Given $\overline{DE} \parallel \overline{AC}$ and $AC = 10$, $DE = 5$, $BD = 5$, what is the measure of AB?



    a. 8
    b. $5\sqrt{2}$
    c. 7.5
    d. 10

29. Figure $ABCD$ is a parallelogram. What is the measure of $\angle ABD$?



    a. 62°
    b. 33°
    c. 65°
    d. 25°

continued

30. Triangle $\triangle ABC$ is a right triangle, and x is the degree measure of one of the two acute angles of the right triangle. Which of the following statements is true?

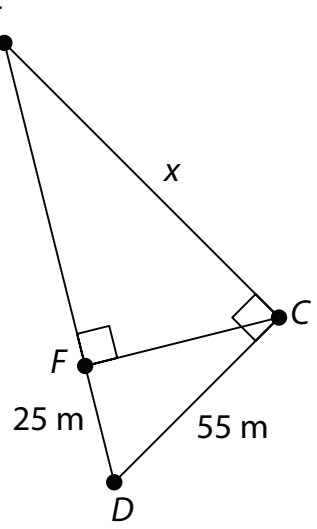
a. $\cos(x) = \sin(90 - x)$

b. $\sin(x) = \sin(90 - x)$

c. $\cos(x) = \cos(90 - x)$

d. $\cos(x) = \sin(x)$

31. $\triangle DCE$ and $\triangle CFE$ are right triangles with sides $DC = 55$ meters and $DF = 25$ meters. What is the measure of side CE, rounded to the nearest hundredth of a meter?



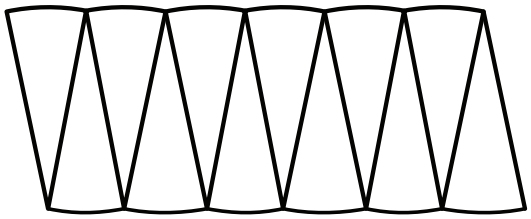
a. 48.99 m

b. 96 m

c. 107.78 m

d. 121 m

32. In order to prove the area of a circle formula, you can dissect a circle into sectors and place the slices side by side. This is shown in the figure below.



Which area formula can be used to prove the area of a circle formula, $A = \pi r^2$?

a. Area of a ellipse

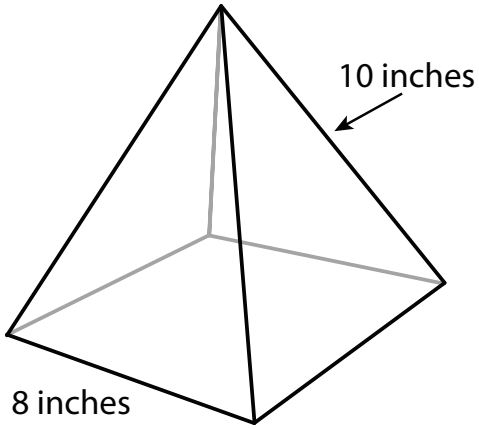
b. Area of a triangle

c. Area of a parallelogram

d. Area of a trapezoid

continued

33. Mason created a model of a square pyramid. What is the volume of the square pyramid, rounded to the nearest tenth?



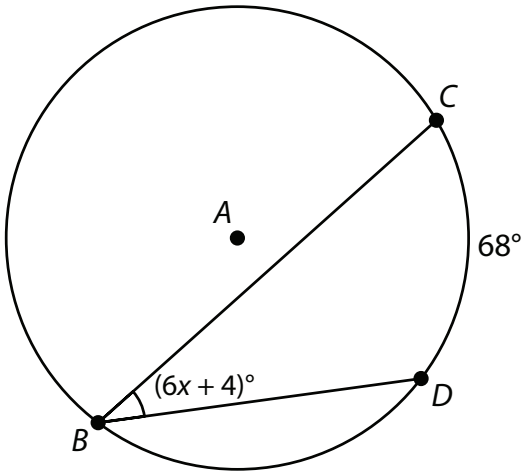
a. 213.33 in^2

b. 175.9 in^2

c. 128 in^2

d. 98.40 in^2

34. In the following diagram of $\odot A$, what is the value of x?



a. $x = 9$

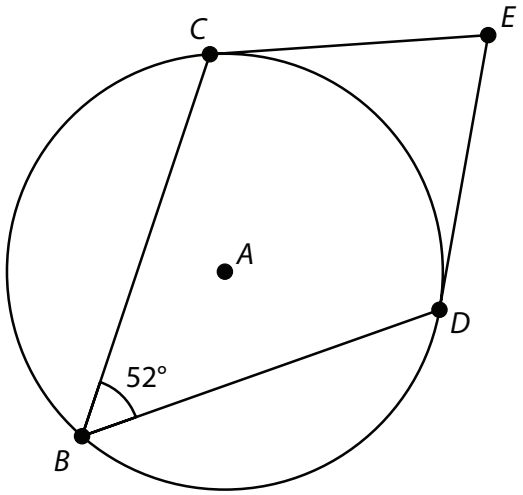
b. $x = 5$

c. $x = \frac{31}{3}$

d. $x = \frac{19}{3}$

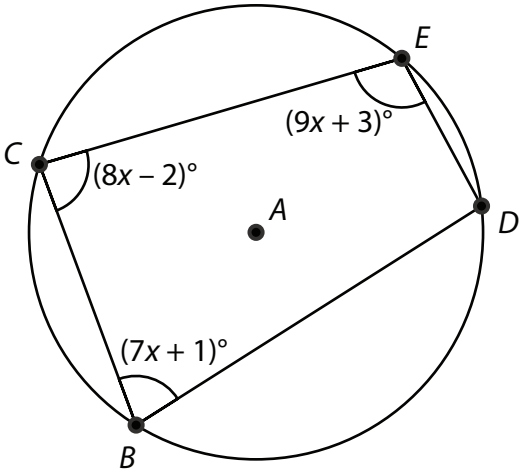
continued

35. In the following diagram, segments $\overline{EC}$ and $\overline{ED}$ are tangent to $\odot A$. What is the measure of $\angle CED$?



a. 104°
b. 78°
c. 76°
d. 52°

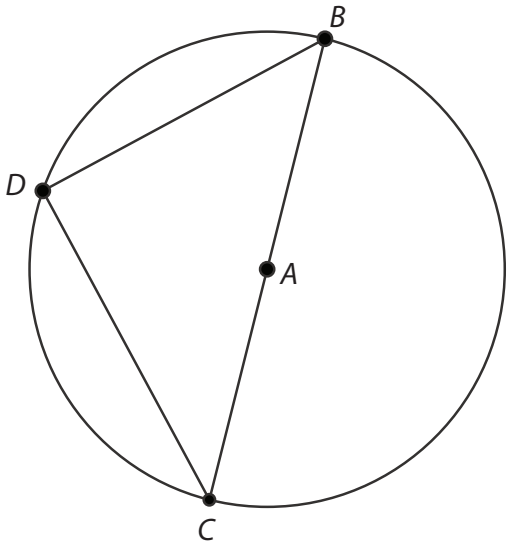
36. In the following diagram, quadrilateral $BCED$ is inscribed in $\odot A$. Find $m\angle EDB$.



a. 11°
b. 86°
c. 94°
d. 102°

continued

37. In the following diagram, $\odot A$ is circumscribed around $\triangle BCD$. Which statement is true?



a. A is the incenter of $\triangle BCD$.

b. $AB = AC = AD$

c. $\angle ABD \cong \angle ACD$

d. $DB = DC$

38. A painter needs to paint a sector of a circle with radius 4 meters. The arc length of the sector is 8 meters. What is the area of the sector that needs to be painted?

a. $16\ m^2$

b. $8\ m^2$

c. $16\pi\ m^2$

d. $8\pi\ m^2$

39. What are the center and radius of the circle with equation $(x + 6)^2 + (y - 2)^2 = 81$?

a. Center: (–6, 2); Radius: 9

b. Center: (6, –2); Radius: 9

c. Center: (–6, 2); Radius: 81

d. Center: (6, –2); Radius: 81

40. What is the center of $\odot ABC$ that passes through coordinates $A(2, 1)$, $B(6, 5)$, and $C(10, 1)$?

a. (6, 1)

b. (6, 4)

c. (8, 3)

d. (4, 2)

continued

Use the given information to complete the following problems.

41. Identify the zeros and the extreme value of $f(x) = -(x - 1)^2 + 3$. State whether the extreme value is a maximum or a minimum.

42. The steps for solving $x^2 + 6x - 4 = 3$ by completing the square are shown. Rewrite the steps in the correct order.

$x^2 + 6x = 7$	**Step 1:**
$\sqrt{(x+3)^2} = \sqrt{16}$	**Step 2:**
$x^2 + 6x + 9 = 16$	**Step 3:**
$x = -7, 1$	**Step 4:**
$x^2 + 6x - 4 = 3$	**Step 5:**
$(x + 3)^2 = 16$	**Step 6:**
$x = -3 \pm 4$	**Step 7:**
$x^2 + 6x + 9 = 7 + 9$	**Step 8:**
$x + 3 = \pm 4$	**Step 9:**

continued

43. A cannonball is launched from ground level and hits the ground 800 feet away. An observer estimates that the cannonball reached a maximum height of 50 feet halfway between the launch point and landing point.

    a. Assuming the launch point is (0, 0), what is the landing point?

    b. What coordinates represent the maximum height of the cannonball?

    c. What equation represents the height of the cannonball when it is x feet horizontally from the launch point?

continued

44. A box contains three blue marbles and two white marbles. Rob pulls a marble from the box at random, then replaces it and selects another. Let B_1, B_2, B_3, W_1, and W_2 represent the different marbles in the box.

    a. List the complete sample space for this scenario.

    b. What is the probability that Rob selects a blue marble both times?

45. A flagpole is anchored to the ground with a support cable. The cable is attached to the flagpole at a point 30 feet above the ground. If the angle of elevation from the ground anchor to the pole attachment point is 25°, how far is the ground anchor from the flagpole? Round your answer to one decimal place, if necessary.