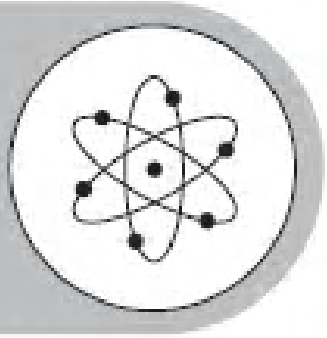
ANALYTIC GEOMETRY

Diagnostic

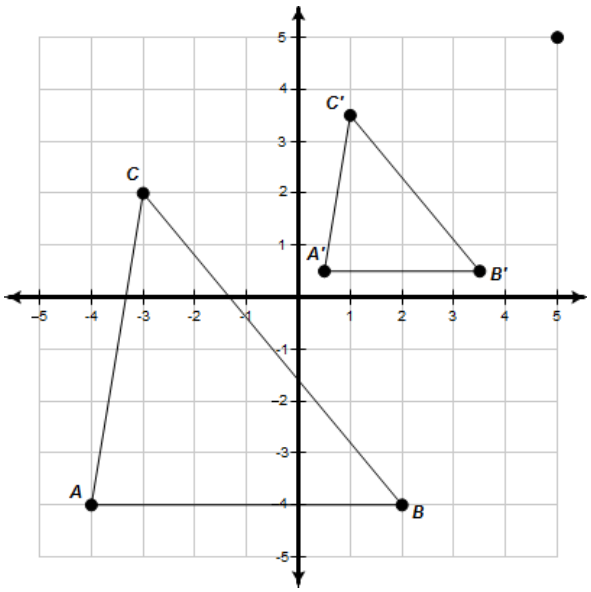
Test



Georgia End-Of-Course Tests

Revised 12/5/13 1:19 pm

DoK: 1 1. $\Delta A'B'C'$ is a dilation of triangle ΔABC by a scale factor of ½. The dilation is centered at the point (5, 5). Which statement below is true?



A. $\frac{AB}{A'B'} = \frac{B'C'}{BC}$

C. $\frac{AB}{BC} = \frac{B'C'}{A'B'}$

B. $\frac{AB}{A'B'} = \frac{BC}{B'C'}$

D. $\frac{AB}{BC} = \frac{A'C'}{B'C'}$

DoK: 2 2. $\Delta A'B'C'$ is a dilation of triangle ΔABC by a scale factor of ½. The dilation is centered at the point (5, 5). What is the ratio of the area of $\Delta A'B'C'$ to the area of ΔABC?

A. ½

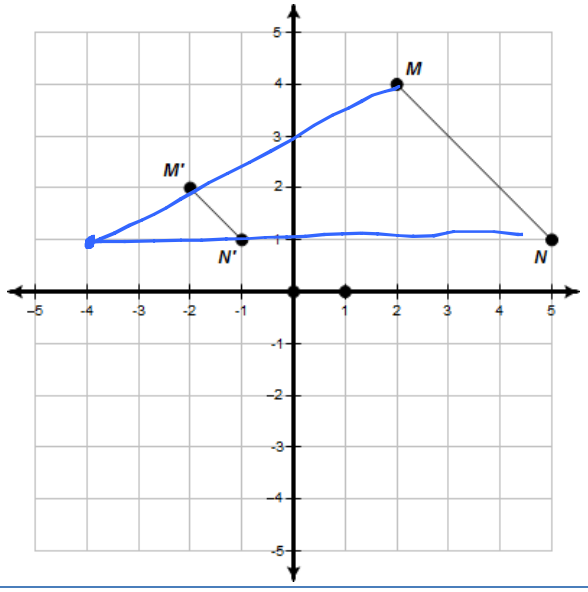
$\frac{\text{AREA } \Delta A'B'C'}{\text{AREA } \Delta ABC} = \left(\frac{1}{2}\right)^2 = \frac{1}{4}$

C. ¼

B. 2

D. 4

DoK: 2 3. In the coordinate plane segment $\overline{M'N'}$ is the result of a dilation of segment $\overline{MN}$ by a scale factor of ⅓. Which point is the center of dilation?



A. (1, 3)

C. (– 5 , 0)

B. (0, 0)

D. (– 4 , 1)

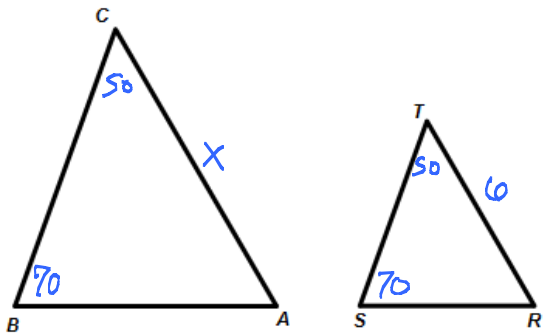
DoK: 1-2 4. In the triangles shown ΔABC is dilated by a factor of ⅔ to form ΔRST. Given that $m\angle B = 70°$ and $m\angle C = 50°$, what is the $m\angle R$?

A. 50°

C. 70°

B. 60°

D. 80°



DoK: 2 5. In the triangles shown ΔABC is dilated by a factor of ⅔ to form ΔRST. Given that $TR = 6\ cm$, what is the length of CA ?

A. 4 cm

C. 4.5 cm

B. 9 cm

D. 7.5 cm

$\frac{6}{x} = \frac{2}{3}$

$\frac{2x}{2} = \frac{18}{2}$ $x = 9$

$180 - 50 - 70 = 60$

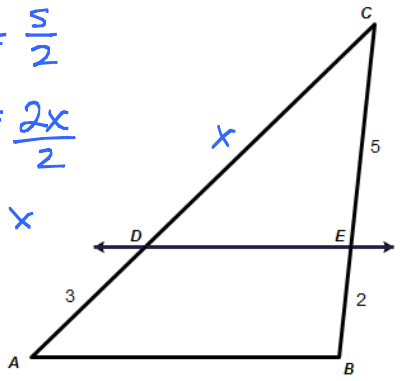
DoK: 2

6. In the triangle shown, $\overline{AB} \parallel \overleftrightarrow{DE}$. What is the length of $\overline{CD}$?

$\frac{x}{3} = \frac{5}{2}$

$\frac{15}{2} = \frac{2x}{2}$

$7.5 = x$



A. 1.2

C. 6.0

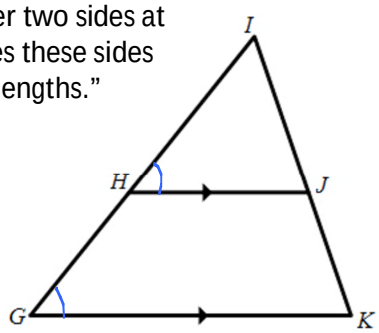
B. 3.3

D. 7.5

DoK: 1

7. In the triangle shown, $\overline{HJ} \parallel \overline{GK}$. The following shows a proof of the statement "If a line is parallel to one side of a triangle and intersects the other two sides at distinct points, then it separates these sides into segments of proportional lengths."

Which reason justifies Step 2?



	Step	Justification
1	$\overline{GK}$ is parallel to $\overline{HJ}$	Given
2	$\angle HGK \cong \angle IHJ$ $\angle IKG \cong \angle IJH$	?
3	$\triangle GIK \sim \triangle HIJ$	AA similarity postulate
4	$\frac{IG}{IH} = \frac{IK}{IJ}$	Corresponding sides of similar triangles are proportional
5	$\frac{HG + IH}{IH} = \frac{JK + IJ}{IJ}$	Segment addition postulate
6	$\frac{HG}{IH} = \frac{JK}{IJ}$	Subtraction property

A. Alternate interior angles are congruent.

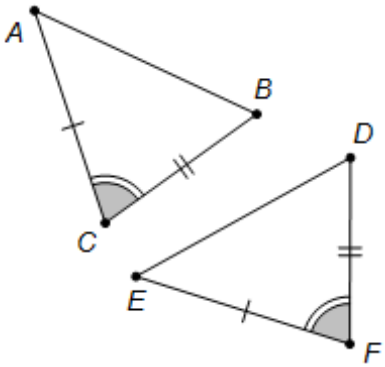
C. Corresponding angles are congruent.

B. Alternate exterior angles are congruent.

D. Vertical angles are congruent.

DoK: 1

8. Consider the triangles shown. Which can be used to prove the triangles are congruent?



A. SAS

C. ASA

B. SSA

D. SSS

DoK: 1-2

9. Consider the triangles shown. Which would be a correct congruence statement?

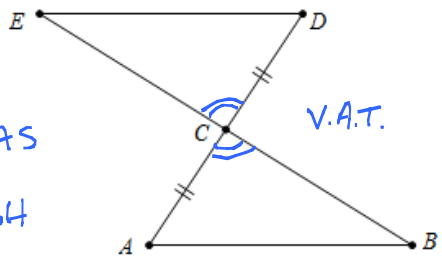
A. $\Delta ABC \cong \Delta DEF$

C. $\Delta BAC \cong \Delta DFE$

B. $\Delta BCA \cong \Delta EDF$

D. $\Delta CAB \cong \Delta FED$

DoK:3 10. In the diagram, $\overline{AC} \cong \overline{DC}$. Which information would provide enough information to prove that $\Delta ABC \cong \Delta DEC$?



A. $\overline{ED} \cong \overline{BA}$: SSA : NOT ENOUGH

B. $\overline{AD} \cong \overline{EB}$: NOT ENOUGH

C. $\overline{ED} \parallel \overline{BA}$ ASA OR AAS

D. $\overline{AD} \perp \overline{EB}$: NOT ENOUGH

DoK:1-2 11. In the diagram, ΔSTU is an isosceles triangle where $\overline{ST}$ is congruent to $\overline{UT}$. The paragraph proof shows that $\measuredangle S$ is congruent to $\measuredangle U$.

It is given that $\overline{ST}$ is congruent to $\overline{UT}$. Draw $\overline{TV}$ such that it bisects $\measuredangle T$. By the defintion of an angle bisector, $\measuredangle STV$ is congruent to $\measuredangle UTV$. Also by the Reflexive Property, $\overline{TV}$ is congruent to $\overline{TV}$. So, $\Delta STV \cong \Delta UTV$ by SAS. Thus, $\measuredangle S$ is congruent to $\measuredangle U$ by **??**.

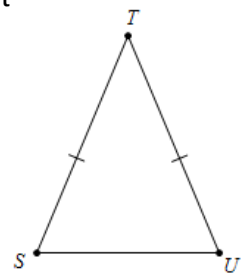


diagram 1

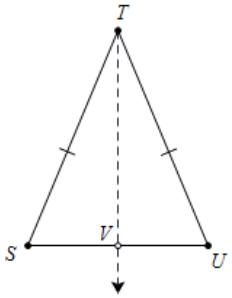


diagram 2

Which step is missing in the proof?

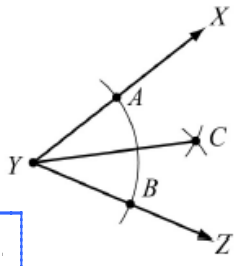
A. Reflexive Property of Congruence

B. Angle Congruence Postulate

C. Definition of right angles

D. CPCTC

DoK:1-2 12. Consider the construction of the angle bisector shown. Which could have been the **first** step in creating this construction?



A. Place the compass point on point *A* and draw an arc inside $\measuredangle Y$.

B. Place the compass point on point *B* and draw an arc inside $\measuredangle Y$.

C. Place the compass point on vertex *Y* and draw an arc that intersects $\overline{YX}$ and $\overline{YZ}$.

D. Place the compass point on vertex *Y* and draw an arc that intersects point *C*.

DoK:1-2 13. Use the line segment $\overline{HI}$ to answer the question. Which step should be first to draw a line perpendicular to $\overline{HI}$ at midpoint *J* ?

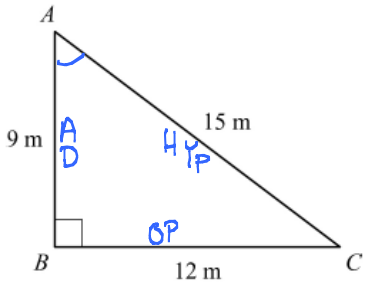
A. Place the compass point on point *H* and set its width to **less** than $\overline{HJ}$.

B. Place the compass point on point *H* and set its width to **more** than $\overline{HJ}$.

C. Place the compass point on point *J* and set its width to **less** than $\overline{HI}$.

D. Place the compass point on point *J* and set its width to **more** than $\overline{HI}$.

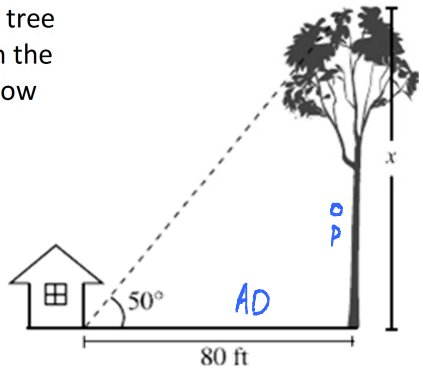
DOK: 1 14. Triangle ABC is shown. What is the value of $\cos A$? $= \frac{AD}{HY} = \frac{9}{15} = \frac{3}{5}$



A. $\frac{3}{5}$ **C.** $\frac{4}{5}$

B. $\frac{3}{4}$ **D.** $\frac{5}{3}$

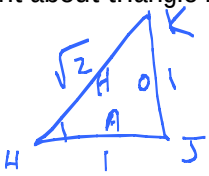
DOK: 1-2 15. There is a large tree 80 feet from a house. The owners are worried that the tree might hit their house if it fell and want to estimate the height of the tree. In the figure below, when the sun's angle of elevation is 50° , the tree casts a shadow 80 feet long. Which can be used to find the height of the tree?



A. $\sin 50° = \frac{80}{x}$ **C.** $\cos 50° = \frac{80}{x}$

B. $\tan 50° = \frac{x}{80}$ **D.** $\sin 50° = \frac{x}{80}$

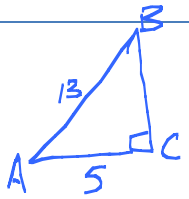
DOK: 2-3 16. In right triangle HJK, $\measuredangle J$ is a right angle and $\tan \measuredangle H = 1$. Which statement about triangle HJK must be true?



A. $\sin \measuredangle H = \frac{1}{2}$ **C.** $\sin \measuredangle H = \cos \measuredangle H$

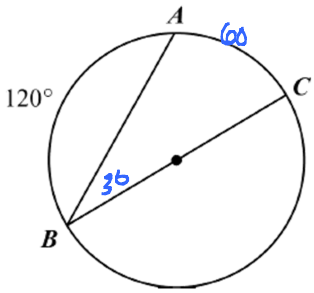
B. $\sin \measuredangle H = 1$ **D.** $\sin \measuredangle H = \frac{1}{\cos \measuredangle H}$

DOK: 1-2 17. In right triangle ABC, $\measuredangle A$ and $\measuredangle B$ and are complementary angles. The value of $\cos A = \frac{5}{13}$. What is the value of $\sin B$?



A. $\frac{5}{13}$ **B.** $\frac{12}{13}$ **C.** $\frac{13}{12}$ **D.** $\frac{13}{5}$

DOK: 2 18. In the circle shown, $\overline{BC}$ is the diameter and $m\,\widehat{AB} = 120°$. What is the measure of $\measuredangle ABC$?



A. 15° **C.** 60°

B. 30° **D.** 120°

DOK: 2-3 19. Circle *P* is dilated to form circle *P'*. Which statement is ALWAYS true?

A. The radius of circle *P* is equal to the radius of circle *P'*. CAN BE IF SCALE FACTOR = 1 BUT NOT ALWAYS

B. The length of any chord in circle *P* is greater than the length of any chord in circle *P'* .

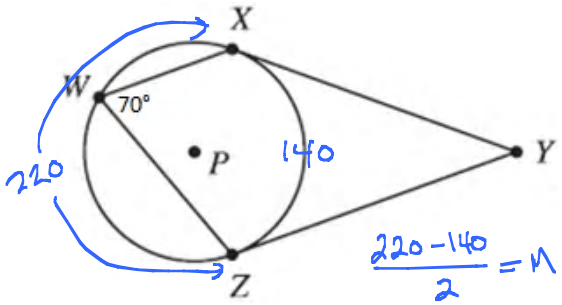
C. The diameter of circle *P* is greater than the diameter of circle *P'*.

D. The ratio of the diameter to the circumference is the same for both circles.

FOR ALL CIRCLES THIS WOULD BE $\frac{1}{\pi}$

DoK: 2

20. Circle with center P has tangents $\overline{XY}$ and $\overline{ZY}$ and chords $\overline{WX}$ and $\overline{WZ}$, as shown in the figure. The measure of $\measuredangle ZWX = 70°$. What is the measure, in degrees, of $\measuredangle XYZ$?



$\frac{220-140}{2} = m\measuredangle Y$

$40 = m\measuredangle Y$

A. 20°

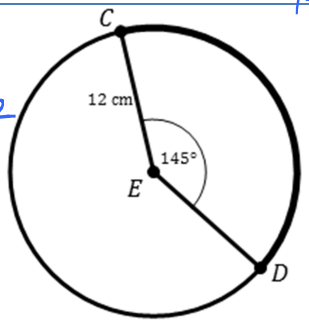
C. 40°

B. 35°

D. 55°

DoK: 1

21. Circle with center E is shown. The measure of $\measuredangle CED = 145°$ and the length of CD is 12 cm. What is the length of $\overset{\frown}{CD}$?



ARC LENGTH $= \frac{145}{360} \cdot 2\pi 12$

$\frac{145}{360} * 2 * 12$ $\frac{29}{3}$

A. $\frac{29}{72}\pi$ cm

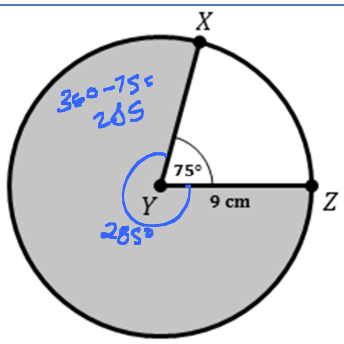
C. $\frac{29}{3}\pi$ cm

B. $\frac{29}{6}\pi$ cm

D. $\frac{29}{2}\pi$ cm

DoK: 1-2

22. Circle with center Y is shown. The measure of $\measuredangle XYZ = 75°$ and the length of YD is 9 cm. What is the area of the shaded part of the circle ?



SECTOR AREA $= \frac{285}{360}\pi \cdot 9^2$

$= \frac{513}{8}\pi$ cm^2

$\frac{285}{360} 9^2$ $\frac{513}{8}$

A. $\frac{57}{4}\pi$ cm^2

C. $\frac{405}{8}\pi$ cm^2

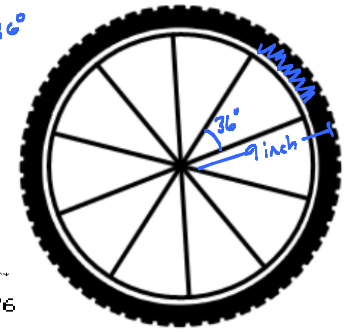
B. $\frac{135}{8}\pi$ cm^2

D. $\frac{513}{8}\pi$ cm^2

DoK: 1-2

23. The spokes of a bicycle wheel form 10 congruent central angles. The diameter of the circle formed by the outer edge of the wheel is 18 inches. What is the length, to the nearest 0.1 inch, of the outer edge of the wheel between two consecutive spokes?

$\frac{360}{10} = 36°$



AL $= \frac{\theta}{360} \cdot 2\pi r$

ARC LENGTH $= \frac{36}{360} \cdot 2\pi 9$ IN

$= \frac{1}{10} \cdot 2\pi(9)$ IN

$(36 \div 360) 2\pi 9$
5.654866776

A. 1.8 inches

C. 11.3 inches

B. 5.7 inches

D. 25.4 inches

DoK: 1

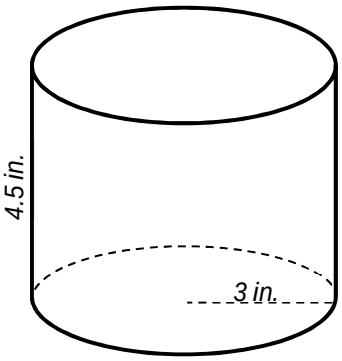
24. What is the volume of a cylinder with a radius of 3 inches and a height of $\frac{9}{2}$ inches?

$V = Bh$

$V = (\pi r^2)h$

$V = \pi 3^2 \cdot 9/2$

$V = \frac{81}{2}\pi$ in^3



A. $\frac{81}{2}\pi$ in.^{3}

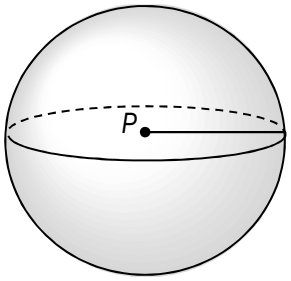
C. $\frac{27}{8}\pi$ in.^{3}

B. $\frac{27}{4}\pi$ in.^{3}

D. $\frac{9}{4}\pi$ in.^{3}

DoK: 2

25. The surface area of the sphere with center P is 36π cm^2. What is the volume of the sphere?



A. 12π cm^3

B. 36π cm^3

C. 48π cm^3

D. 288π cm^3

$SA = 4\pi r^2$ | $V = \frac{4}{3}\pi r^3$

$\frac{36\pi}{4\pi} = \frac{4\pi r^2}{4\pi}$ | $V = \frac{4}{3}\pi (3)^3$

$\sqrt{9} = \sqrt{r^2}$ | $V = 36\pi$ cm^3

$3 = r$

DoK: 2

26. The cone shown has a base with a radius of AB. The length of AB = 6 cm and the length of BC = 10 cm. What is the volume of the cone?

A. 288π cm^3

B. 360π cm^3

C. $\frac{640}{3}\pi$ cm^3

D. 96π cm^3

$V = \frac{Bh}{3}$

$V = \frac{(\pi r^2)h}{3}$

$V = \frac{\pi \cdot 6^2 \cdot 8}{3}$

$V = 96\pi$ cm^3

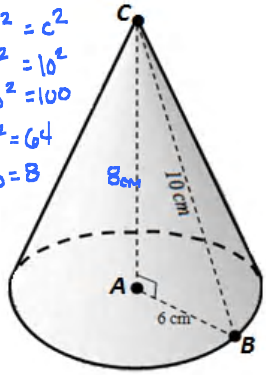
$a^2 + b^2 = c^2$

$6^2 + b^2 = 10^2$

$36 + b^2 = 100$

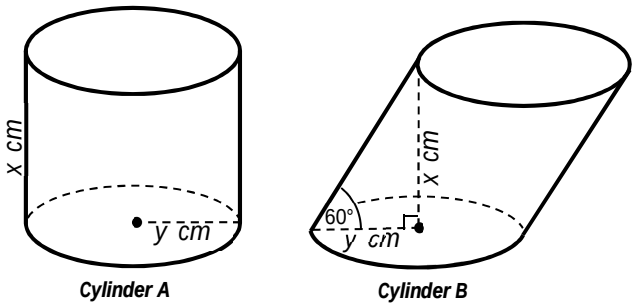
$b^2 = 64$

$b = 8$



DoK: 1

27. Two different cylinders are shown. Both cylinders have the same height, x cm, and same radius, y cm. The only difference is Cylinder B has been slanted by 60°. Which statement below is true?



A. Cylinder A has a **bigger** volume than Cylinder B

B. Cylinder A has a **smaller** volume than Cylinder B

C. Cylinder A has the **same** volume than Cylinder B

CYLINDER A HAS LESS SURFACE AREA THAN CYLINDER B BUT THE SAME VOLUME.

D. Not enough information is provided to determine which is cylinder has a bigger volume.

DoK: 2

28. Which expression is equivalent to $\frac{\sqrt{x}}{x^3}$?

$\frac{x^{1/2}}{x^3} = \frac{1}{x^{5/2}} = \frac{1}{\sqrt{x^5}} = \frac{1}{x^2\sqrt{x}}$

A. $x^{5/2}$

B. $\sqrt{x^5}$

C. $\frac{1}{\sqrt{x^5}}$

D. $\frac{1}{x\sqrt{x}}$

DoK: 1-2

29. Which expression is equivalent to $\sqrt{27} - \sqrt{12}$?

A. $\sqrt{3}$

B. $2\sqrt{6}$

C. $5\sqrt{3}$

D. $-\sqrt{3}$

$\sqrt{27} - \sqrt{12}$

$9 \cdot 3$ | $4 \cdot 3$

$3 \cdot 3 \cdot 3$ | $2 \cdot 2 \cdot 3$

$3\sqrt{3} - 2\sqrt{3} = \sqrt{3}$

DoK: 1-2 30. Which expression is equivalent to $\sqrt[3]{64x^{\frac{6}{7}}}$? $= \left(64x^{6/7}\right)^{1/3} = 64^{1/3} \times x^{6/21} = 4x^{2/7}$

A. $4x^{\frac{2}{7}}$ **B.** $4x^{\frac{18}{7}}$ **C.** $64x^{\frac{2}{7}}$ **D.** $64x^{18}$

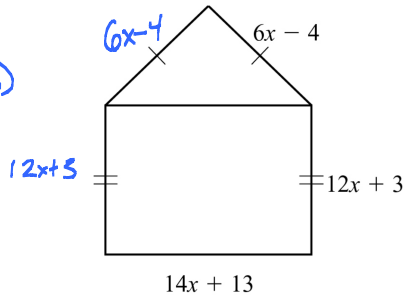
DoK: 2 31. Which expression has a value that is a rational number?

A. $\sqrt{10} + 11$ IRRAT **B.** $3(\sqrt{3} + \sqrt{5})$ IRRAT **C.** $\sqrt{9} + \sqrt{16}$ $3 + 4 =$ RAT **D.** $\sqrt{7} + 2$ IRRAT

DoK: 2-3 32. Let ***a*** be a nonzero rational number and ***b*** be an irrational number. Which of these expressions MUST be a rational number?

A. b + 0 = ADDITIVE IDENTITY IRRATIONAL **B.** a + a $\frac{a}{b} + \frac{c}{d} = \frac{ad+bc}{bd}$ RAT + RAT. = RAT. **C.** a + b = IRRAT **D.** b + b = 2b IRRAT

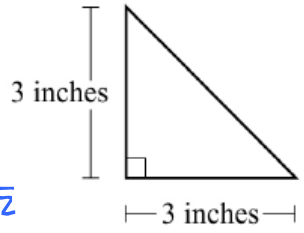
DoK: 1-2 33. A model of a house is shown. What is the perimeter, in units, of the model? $(6x-4) + (6x-4) + (12x+3) + (14x+13) + (12x+3)$



A. $32x + 12$ **C.** $50x + 11$

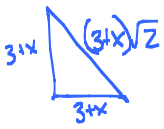
B. $46x + 25$ **D.** $64x + 24$

DoK: 1-2 34. Kelly makes two different-sized ceramic tiles in the shape of right isosceles triangles. This diagram shows the leg lengths of the small tile. Kelly makes a larger tile by increasing the length of each leg of the small tile by x inches. Which expression represents the length, in inches, of the hypotenuse of the large tile?



A. $18 + x$ **C.** $(x + 3)\sqrt{2}$

B. $(x + 3)^2$ **D.** $3\sqrt{2} + x$



DoK: 1-2 35. Which has the same value as $-i^9 + i^3$?

A. $-2i$ **B.** -2 **C.** 2 **D.** $2i$

$-(i^2 \cdot i^2 \cdot i^2 \cdot i^2 \cdot i) + (i^2 \cdot i)$

$-(-1 \cdot -1 \cdot -1 \cdot -1 \cdot i) + (-1 \cdot i)$

$-i + -i = -2i$

DOK: 1-2 36. Which has the same value as $(5-3i)(-4+2i)$? $= -20+10i+12i-6i^2$ $-20+10i+12i+6$

A. $-26-2i$ **B.** $-26+22i$ **C.** $-14-2i$ **D.** $-14+22i$

DOK: 1-2 37. What are the solutions to the equation $2x^2+3x+9=0$? $x=\frac{-3\pm\sqrt{9-4(2)(9)}}{2(2)}=\frac{-3\pm\sqrt{-63}}{4}=\frac{-3\pm3i\sqrt{7}}{4}$

A. $x=\frac{3}{4}\pm\frac{21}{4}i$ **B.** $x=-\frac{3}{4}\pm\frac{21}{4}i$ **C.** $x=\frac{3}{4}\pm\frac{3i\sqrt{7}}{4}$ **D.** $x=-\frac{3}{4}\pm\frac{3i\sqrt{7}}{4}$

DOK: 1 38. Given the expression $2n^2-n-3$, what is the coefficient of the n term?

A. 1 **B.** -1 **C.** 2 **D.** -3

DOK: 1-2 39. Which expression is equivalent to $121x^4-64y^6$? $11x^2\ 11x^2$ $8y^3\ 8y^3$

A. $(11x^2-16y^2)(11x^2+16y^2)$ **C.** $(11x^2+8y^2)(11x^2+8y^2)$

B. $(11x^2-16y^3)(11x^2-16y^3)$ **D.** $(11x^2+8y^3)(11x^2-8y^3)$

DOK: 2 40. Given the expression $6a^2+7a-3$, which of the following is a factor of the expression? -18 $9,-2$ $\frac{6a+9}{3}$ $\frac{6a-2}{2}$ $(2a+3)(3a-1)$

A. $(3a-1)$ **B.** $(2a-3)$ **C.** $(6a+1)$ **D.** $(2a-1)$

DOK: 2 41. What is the vertex of the graph of $f(x)=x^2+10x-9$? $\left(\frac{-10}{2},\ \right)$ $(-5,\ )$

A. $(5,66)$ **B.** $(5,-9)$ **C.** $(-5,-9)$ **D.** $(-5,-34)$

$f(-5)=(-5)^2+10(-5)-9=25-50-9=-34$

DOK: 2-3 42. The line $y=3.25$ is the directrix of the parabola $y=-x^2+4x-1$. What are the coordinates of the FOCUS of the parabola? $\left(\frac{-4}{-2},\ \right)$ $(2,\ 3)$ $p=-0.25$

A. $(-2,\ 2.75)$ **B.** $(2,\ 2.75)$ **C.** $(-2,-5.25)$ **D.** $(2,5.25)$

$y=-(2)^2+4(2)-1=3$

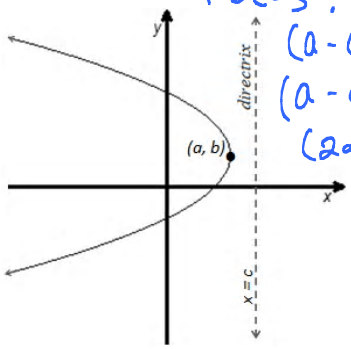
DOK: 1-2 43. Consider the parabola in standard form $y=-2x^2+12x-5$. This is to be rewritten in vertex form by completing the square. In completing the square what should 'a' be in the following equation so that it is still the same parabola $y=-2(x^2-6x+9)+a-5$.

A. 9 **B.** -9

C. 18 D. -18

$p = c - a$

DOK: 2-3 44. The parabola at the right has vertex (a, b) and a directrix at x = c. If the parabola opens to the left as shown, what is the coordinates of the focus point?



Focus: $(a-(c-a), b)$ $(a-c+a, b)$ $(2a-c, b)$

A. $(2a - c,\ b)$ **C.** $(a,\ b - c)$

B. $(a - c,\ b)$ **D.** $(a,\ 2b - c)$

DOK: 2 45. The expression $-x^2 + 70x - 600$ represents a company's profit for selling *x* items. For which number(s) of items sold is the company's profit equal to $0?

$0 = -x^2 + 70x - 600$
$0 = -(x^2 - 70x + 600)$
$0 = -(x-60)(x-10)$
$x = 60$ $x = 10$

A. 0 items **B.** 35 items **C.** 10 items & 60 items **D.** 20 items & 30 items

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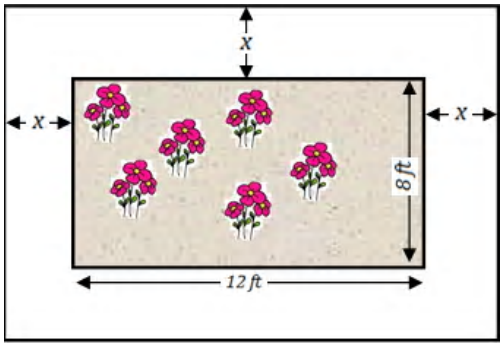
DOK: 2 46. A garden measuring 8 feet by 12 feet will have a walkway around it. The walkway has a uniform width, and the area covered by the garden and the walkway is 192 square feet. What is the width of the walkway?



$(8+2x)(12+2x) = 192$
$4x^2 + 40x + 96 = 192$
$4x^2 + 40x - 96 = 0$
$4(x^2 + 10x - 24) = 0$
$4(x+12)(x-2) = 0$
$x = -12$ $x = 2$

A. 2 feet **C.** 4 feet

B. 3.5 feet **D.** 6 feet

DOK: 1-2 47. The formula for the surface area of a cone is $SA = \pi r^2 + \pi rs$. Which equation shows the formula in terms of s?

$\frac{SA - \pi r^2}{\pi r} = \frac{\pi rs}{\pi r}$ $-\pi r^2 \ -\pi r^2$
$\frac{SA - \pi r^2}{\pi r} = s$

A. $s = \frac{SA}{\pi r} - \pi r^2$ **C.** $s = \frac{SA - \pi r^2}{\pi r}$

B. $s = \frac{SA}{\pi r} + \pi r^2$ **D.** $s = \frac{SA + \pi r^2}{\pi r}$

DOK: 1-2 48. What are the solutions to the equation $2x^2 - 2x = 12$?

$2x^2 - 2x - 12 = 0$
$2(x^2 - x - 6) = 0$
$2(x-3)(x+2) = 0$
$x = 3$ $x = -2$

A. $x = -4, 3$ **B.** $x = -3, 4$ **C.** $x = -2, 3$ **D.** $x = -6, 2$

DOK: 1-2 49. What are the solutions of this system of equations?

$y = 5x^2 + 7x - 6$
$y = 12x - 6$

$12x - 6 = 5x^2 + 7x - 6$
$0 = 5x^2 - 5x$
$0 = 5x(x-1)$
$x = 0$ $x = 1$

$x = 0$: $y = 12(0) - 6$, $y = 0 - 6$, $y = -6$, $(0, -6)$

$x = 1$: $y = 12(1) - 6$, $y = 12 - 6$, $y = 6$, $(1, 6)$

A. (0, 6) and (1, −6) **B.** (0, −6) and (1, −6)

C. $(0, -6)$ and $(1, 6)$ D. $(-6, 0)$ and $(6, 1)$

DOK: 1-2 50. Use the table to answer the question. What is the average rate of change of $f(x)$ over the interval $-2 \le f(x) \le 0$?

x	$f(x)$
−2	15
−1	9
0	5
1	3
2	3

$M = \frac{5-15}{0-2} = \frac{-10}{2} = -5$

A. −10 **C.** 5

B. −5 **D.** 1

DOK: 1 51. What is the end behavior of the graph of $f(x) = -0.25x^2 - 2x + 1$?

A. As *x* increases, *f(x)* increases.
As *x* decreases, *f(x)* decreases.

B. As *x* increases, *f(x)* decreases.
As *x* decreases, *f(x)* decreases.

C. As *x* increases, *f(x)* increases.
As *x* decreases, *f(x)* increases.

D. As *x* increases, *f(x)* decreases.
As *x* decreases, *f(x)* increases.

DOK: 2 52. What explicit expression can be used to find the next term in this sequence?

2, 8, 18, 32, 50, ...

n=1 n=2 n=3 n=4 n=5

n = 2 : 2(2) = 4 ✗ n = 2 : 2(2)² = 8 ✓

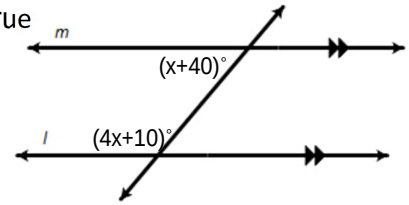
A. 2n n = 1 : 2(1) = 2 ✓

B. 2n + 6 n = 1 : 2(1) + 6 = 8 ✗

C. $2n^2$ n = 1 : 2(1)² = 2 ✓

D. $2n^2 + 1$ n = 1 : 2(1)² + 1 = 3 ✗

DOK: 2 53. Given that line *m* is parallel to line *m*, find the value of x that makes the diagram true



(x + 40) + (4x + 10) = 180
5x + 50 = 180
5x = 130
x = 26

A. x = 10 **C.** x = 30

B. x = 26 **D.** x = 22

DOK: 1 54. Which of these functions is an even function?

A. $f(x) = 5x^2 - x^1$ NEITHER

B. $f(x) = 3x^3 + x^1$ ODD

C. $f(x) = 6x^2 - 8x^0$ EVEN

D. $f(x) = 4x^3 + 2x^2$ NEITHER

DOK: 3 55. The table shows a few values of each function for different values of *x*. Which would you predict BEST describes the comparison of the function values for *f(x)* and *g(x)*?

x	f(x)	g(x)
0	0	−10
1	2	−9
2	4	−6
3	6	−1
4	8	6
⋮ 5	⋮ 10	⋮ 15

A. The values of *f(x)* will always exceed the values *g(x)*.

B. The values of *g(x)* will always exceed the values *f(x)*.

C. The values of *f(x)* exceeds the values *g(x)* over the entire interval [0, 5].

D. The values of *g(x)* exceeds the values *f(x)* over the entire interval [5, 6].

$x^2 - 10x + 25 + y^2 = 11 + 25$ $(x-5)^2 + y^2 = 36$

DOK: 1-2 56. What is the center of the circle given by the equation $x^2 + y^2 - 10x - 11 = 0$?

A. $(5, 0)$ **B.** $(0, 5)$ **C.** $(-5, 0)$ **D.** $(0, -5)$

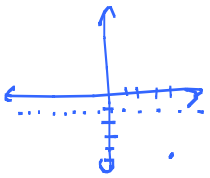
DOK: 2 57. Which shows an equation for a parabola with a focus at $(4, -5)$ and a directrix of $y = -1$?

VERTEX: $(4, -3)$ $p = -2$

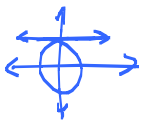
$a = \frac{1}{4p} = \frac{1}{4(-2)} = -\frac{1}{8}$ $y + 3 = -\frac{1}{8}(x-4)^2$

A. $y + 3 = \frac{1}{4}(x-4)^2$ **C.** $y + 3 = -\frac{1}{8}(x-4)^2$

B. $y - 4 = \frac{1}{4}(x+3)^2$ **D.** $y - 4 = -\frac{1}{8}(x+3)^2$



DOK: 2 58. A circle is centered at the origin and has a radius of 3 units. A horizontal line passes through the point (0, 3). In how many places does the line intersect the circle?



A. 0 **B.** 1 **C.** 2 **D.** Infinitely many

DOK: 1 59. Which statement BEST describes the graph of $f(x + 6)$?

A. The graph of *f(x)* shifted up 6 units.

B. The graph of *f(x)* shifted left 6 units.

C. The graph of *f(x)* shifted right 6 units.

D. The graph of *f(x)* shifted down 6 units.

DOK: 1 60. Which is information is needed to show that a parallelogram is a rectangle?

A. The diagonals bisect each other.

B. The diagonals are congruent.

C. The diagonals are congruent and perpendicular.

D. The diagonals bisect each other and are perpendicular.

DOK: 1 61. If all of the medians of a triangle were constructed, what would the point where they all intersect be called?

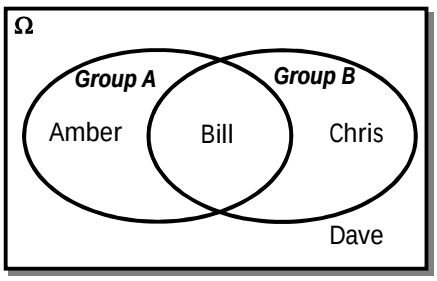
A. Incenter **C.** Centroid

B. Orthocenter **D.** Circumcenter

DOK: 1-2 62. Which students would be members of the group $(A \cap B)'$?

A. {Amber, Chris} **C.** {Dave}

B. {Bill} **D.** {Amber, Chris, Dave}

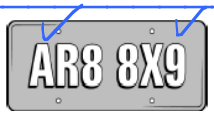


DOK : 2 63. In a particular state, the first character on a license plate is always a letter. The last character is always a digit from 0 to 9. Let V represents the set of all license plates beginning with a vowel, and O represents the set of all license plates that end with an odd number.

Which might be a license plate that belongs to the set $(\boldsymbol{V} \cap \boldsymbol{O})$?

A. 

B. 

C. 

D. 

DOK: 1-2 64. A random survey was conducted about gender and hair color. This table records the data. What is the probability that a randomly selected person has blonde hair, give that the person selected is male?

A. 0.51

548+876+82 1506
876÷1506
0.581673307

B. 0.55

C. 0.58

D. 0.63

$\frac{876}{1506}$

Hair Color

	Brown	Blonde	Red
Male	548	876	82
Female	612	716	66

DOK: 2 65. Assume that the following events are independent:

- The probability that a high school senior will go to college is 0.72
- The probability that a high school senior will go to college and live on campus is 0.46

What is the probability that a high school senior will live on campus, given that the person will go to college?

$P(B|A) = \frac{P(A \text{ AND } B)}{P(A)} = \frac{.46}{.72} = 0.63\overline{8}$

A. 0.26 **B.** 0.33 **C.** 0.57 **D.** 0.64

DOK: 2-3 66. Mrs. Scott surveyed 240 men and 285 women about their vehicles. Of those surveyed 155 men and 70 women said they own a red vehicle. If a person is chosen at random from those surveyed, what is the probability of choosing a woman or a person that does NOT own a red vehicle?

$P(A) + P(B) - P(A \& B)$

$\frac{285}{525} + \frac{300}{525} - \frac{215}{525} = \frac{74}{105}$

A. $\frac{14}{57}$ **B.** $\frac{71}{105}$ **C.** $\frac{74}{105}$ **D.** $\frac{88}{105}$

DOK: 2 67. Margret spins two spinners that have four equal sections numbered 1 through 4. If she spins a 4 on at least one spin, what is the probability that the sum of her two spins is an odd number?

(1,4) (4,1) (2,4) (4,2) (3,4) (4,3) (4,4)

A. $\frac{1}{4}$ **B.** $\frac{7}{16}$ **C.** $\frac{4}{7}$ **D.** $\frac{11}{16}$

DOK: 2 68. Each letter of the alphabet is written on a card using a red ink pen and placed in a container. Each letter of the alphabet is also written on a card using a black pen and placed in the same container. A single card is drawn at random from the container. What is the probability that the card has a letter written in red ink, the letter B, or the letter R?

A. $\frac{1}{2}$ **B.** $\frac{7}{13}$ **C.** $\frac{15}{26}$ **D.** $\frac{8}{13}$

$P(A) + P(B) - P(A \& B)$

$\frac{26}{52} + \frac{4}{52} - \frac{2}{52} = \frac{28}{52} = \frac{7}{13}$