

$E=29 \quad m=20 \quad H=13$

Analytical Geometry- Common Core

Hirsch 😊 Mock EOCT

- E 1. $\Delta A'B'C'$ is a dilation of triangle ΔABC by a scale factor of $\frac{1}{2}$. The dilation is centered at the point (5, 5). Which statement below is true?

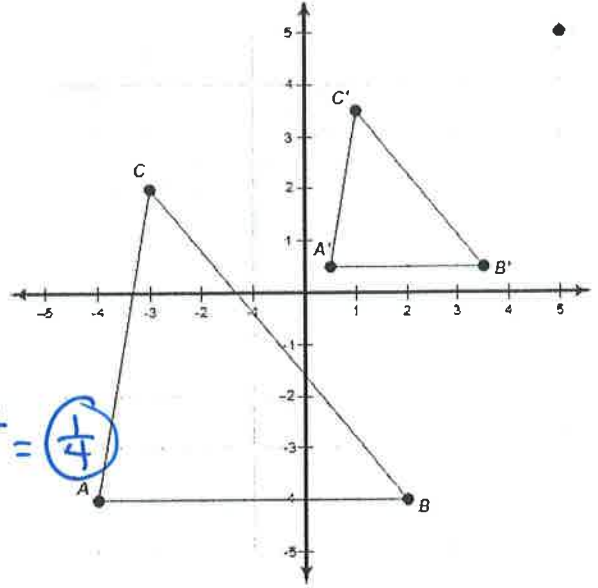
A. $\frac{AB}{A'B'} = \frac{B'C'}{BC}$

look for corresponding parts.

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

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

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



- M 2. $\Delta A'B'C'$ is a dilation of triangle ΔABC by a scale factor of $\frac{1}{2}$. 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. $\frac{1}{2}$

Area is square units so square the scale factor.

C. $\frac{1}{4}$

B. 2

D. 4

$(\frac{1}{2})^2 = \frac{1}{4}$

- H 3. In the coordinate plane segment $\overline{M'N'}$ is the result of a dilation of segment \overline{MN} by a scale factor of $\frac{1}{3}$. Which point is the center of dilation?

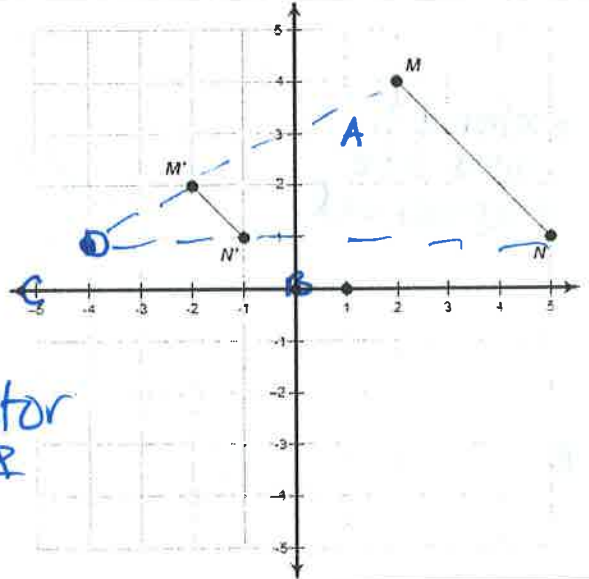
~~A. (1, 3)~~

C. (-5, 0)

~~B. (0, 0)~~

D. (-4, 1)

can't be b/c



- think of a flashlight / projector
- connect corresponding dots & see where they intersect.

- E 4. In the triangles shown ΔABC is dilated by a factor of $\frac{2}{3}$ to form ΔRST . Given that $m\angle B = 70^\circ$ and $m\angle C = 50^\circ$, what is the $m\angle R$?

A. 50°

$\frac{180 - 70 - 50}{3} = 60$

C. 70°

B. 60°

D. 80°

$\angle R = \angle A$ because Δ 's are similar.

- M 5. In the triangles shown ΔABC is dilated by a factor of $\frac{2}{3}$ to form ΔRST . Given that $TR = 6$ cm, what is the length of CA ?

A. 4 cm

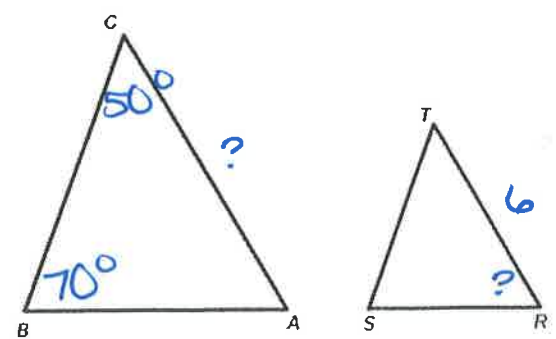
$4 \cdot \frac{2}{3} = \frac{8}{3}$

C. 4.5 cm

B. 9 cm

$9 \cdot \frac{2}{3} = 6$

D. 7.5 cm



AC must be longer so A and C can be eliminated

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

A. 1.2

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

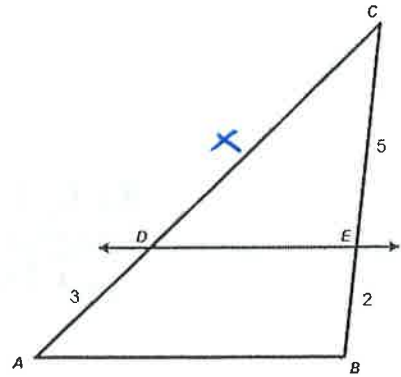
$$2x = 15$$

$$x = 7.5$$

C. 6.0

B. 3.3

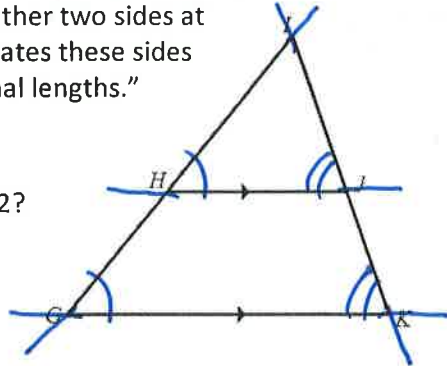
D. 7.5



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?

extend to look like transversal



	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.

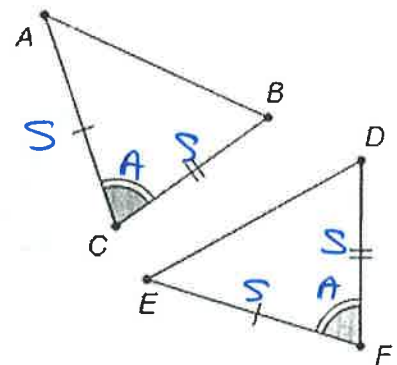
8. Consider the triangles shown. Which can be used to prove the triangles are congruent?

A. SAS

C. ASA

B. SSA

D. SSS



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

A. $\triangle ABC \cong \triangle DEF$

C. $\triangle BAC \cong \triangle DFE$

B. $\triangle BCA \cong \triangle EDF$

D. $\triangle CAB \cong \triangle FED$

H

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

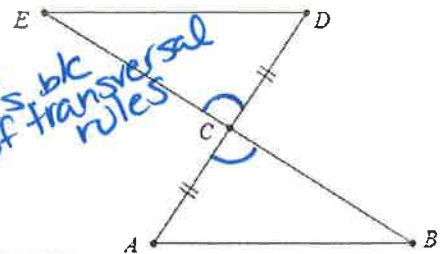
~~A.~~ $\overline{ED} \cong \overline{BA}$ ASS

B. $\overline{AD} \cong \overline{EB}$

C. $\overline{ED} \parallel \overline{BA}$

D. $\overline{AD} \perp \overline{EB}$

If // you can mark \angle 's b/c of transversal rules
AS or leg but need 1 more



M

11. In the diagram, $\triangle STU$ is an isosceles triangle where \overline{ST} is congruent to \overline{UT} . The paragraph proof shows that $\angle S$ is congruent to $\angle U$.

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

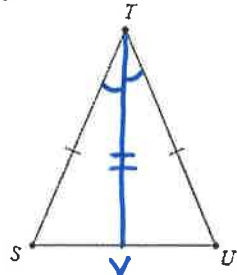


diagram 1

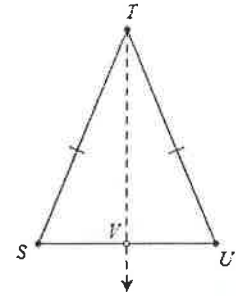


diagram 2

Which step is missing in the proof?

A. Reflexive Property of Congruence

C. Definition of right angles

B. Angle Congruence Postulate

D. CPCTC

E

12. Consider the construction of the angle bisector shown. Which could have been the first step in creating this construction?

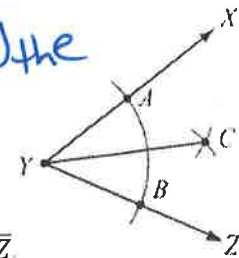
A. Place the compass point on point A and draw an arc inside $\angle Y$.

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

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.

drawing arc is the 1st step.



E

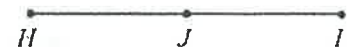
13. Use the line segment \overline{HI} to answer the question. Which step should be first to draw a line perpendicular to \overline{HI} at midpoint J?

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} .

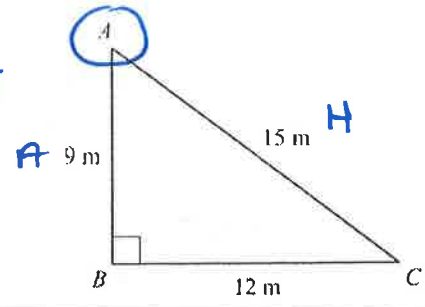
C. Place the compass point on point J and set its width to less than \overline{HI} .

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



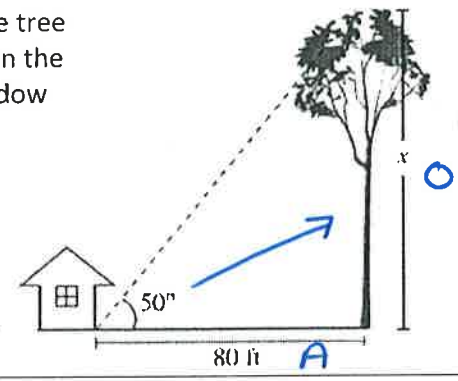
E 14. Triangle ABC is shown. What is the value of $\cos A$? $\frac{A}{H} = \frac{9}{15}$

- A. $\frac{3}{5}$
- B. $\frac{3}{4}$
- C. $\frac{4}{5}$
- D. $\frac{5}{3}$



E 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. $\sin 50^\circ = \frac{80}{x}$
- B. $\tan 50^\circ = \frac{x}{80}$
- C. $\cos 50^\circ = \frac{80}{x}$
- D. $\sin 50^\circ = \frac{x}{80}$

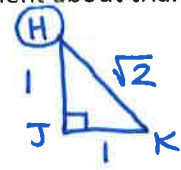


H 16. In right triangle HJK, $\angle J$ is a right angle and $\tan \angle H = 1$. Which statement about triangle HJK must be true?

PICK A that divides to give you 1.

- A. $\sin \angle H = \frac{1}{2}$
- B. $\sin \angle H = 1$
- C. $\sin \angle H = \cos \angle H$
- D. $\sin \angle H = \frac{1}{\cos \angle H}$

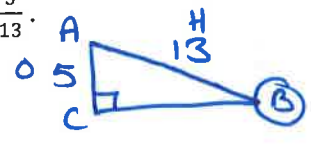
both are $\frac{1}{\sqrt{2}}$



$1^2 + 1^2 = C^2$
 $2 = C^2$
 $\sqrt{2} = C$

M 17. In right triangle ABC, $\angle A$ and $\angle B$ are complementary angles. The value of $\cos A = \frac{5}{13}$. What is the value of $\sin B$?

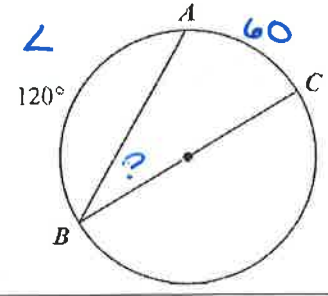
- A. $\frac{5}{13}$
- B. $\frac{12}{13}$
- C. $\frac{13}{12}$
- D. $\frac{13}{5}$



E 18. In the circle shown, \overline{BC} is the diameter and $m\widehat{AB} = 120^\circ$. What is the measure of $\angle ABC$?

- A. 15°
- B. 30°
- C. 60°
- D. 120°

inscribed \angle
 $\frac{60}{2} = 30$



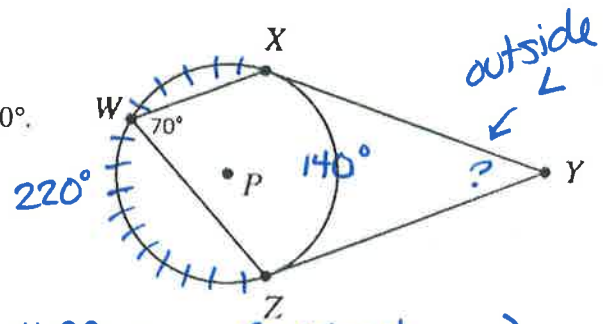
M 19. Circle P is dilated to form circle P'. Which statement is ALWAYS true?

- A. The radius of circle P is equal to the radius of circle P'.
- 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.

dilation can get bigger or smaller depending on scale factor.

M

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 $\angle ZWX = 70^\circ$. What is the measure, in degrees, of $\angle XYZ$?

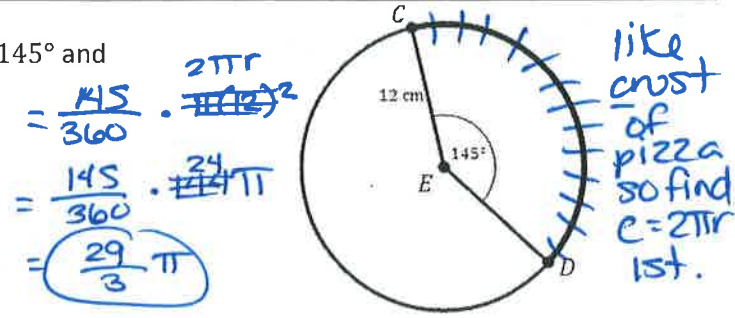


- A. 20° $\frac{220 - 140}{2}$ C. 40°
 B. 35° $\frac{80}{2} = 40$ D. 55°

* outsiders are different so take the difference (subtract arcs)

E

21. Circle with center E is shown. The measure of $\angle CED = 145^\circ$ and the length of CE is 12 cm. What is the length of \overline{CD} ?



- A. $\frac{29}{72}\pi$ cm C. $\frac{29}{3}\pi$ cm
 B. $\frac{29}{6}\pi$ cm D. $\frac{29}{2}\pi$ cm

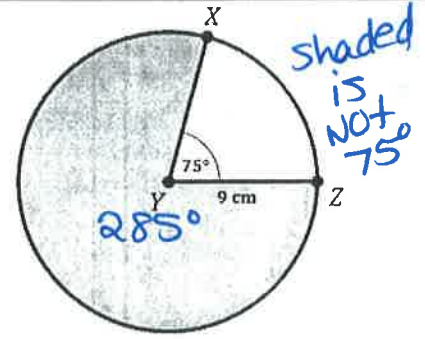
$$= \frac{145}{360} \cdot \cancel{2\pi r}^2$$

$$= \frac{145}{360} \cdot \cancel{24} \pi$$

$$= \frac{29}{3} \pi$$

M

22. Circle with center Y is shown. The measure of $\angle XYZ = 75^\circ$ and the length of YZ is 9 cm. What is the area of the shaded part of the circle?



- A. $\frac{57}{4}\pi$ cm² C. $\frac{405}{8}\pi$ cm²
 B. $\frac{135}{8}\pi$ cm² D. $\frac{513}{8}\pi$ cm²

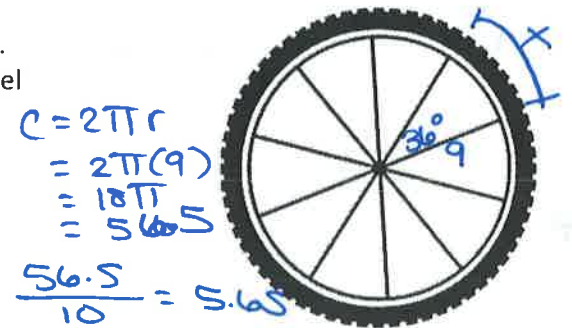
$$= \frac{285}{360} \cdot \pi(9)^2$$

$$= \frac{285}{360} \cdot 81\pi$$

$$= \frac{513\pi}{8}$$

E

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?



- A. 1.8 inches C. 11.3 inches
 B. 5.7 inches D. 25.4 inches

$$C = 2\pi r$$

$$= 2\pi(9)$$

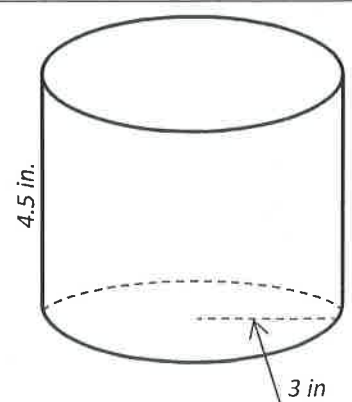
$$= 18\pi$$

$$= 56.5$$

$$\frac{56.5}{10} = 5.65$$

E

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



- 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

$$V = Bh$$

$$B = \pi r^2$$

$$= \pi(3)^2$$

$$= 9\pi$$

$$V = 9\pi \left(\frac{9}{2}\right)$$

$$= \frac{81\pi}{2}$$

H 25. The surface area of the sphere with center P is $36\pi \text{ cm}^2$. What is the volume of the sphere?

- A. $12\pi \text{ cm}^3$
- B. $36\pi \text{ cm}^3$
- C. $48\pi \text{ cm}^3$
- D. $288\pi \text{ cm}^3$

$$SA = 4\pi r^2$$

$$\frac{36\pi}{4\pi} = \frac{4\pi r^2}{4\pi}$$

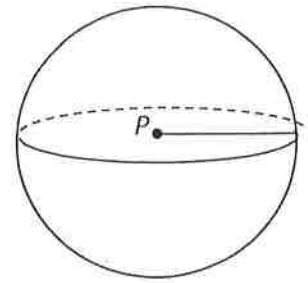
$$9 = r^2$$

$$3 = r$$

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

$$= \frac{4}{3}\pi(3)^3$$

$$= 36\pi$$



H 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. $288\pi \text{ cm}^3$
- B. $360\pi \text{ cm}^3$
- C. $\frac{640}{3}\pi \text{ cm}^3$
- D. $96\pi \text{ cm}^3$

$$V = \frac{1}{3}Bh$$

$$B = \pi r^2$$

$$= \pi(6)^2 = 36\pi$$

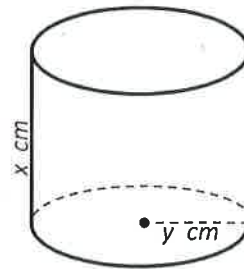
$$V = \frac{1}{3}(36\pi)(10)$$

$$V = 96\pi$$

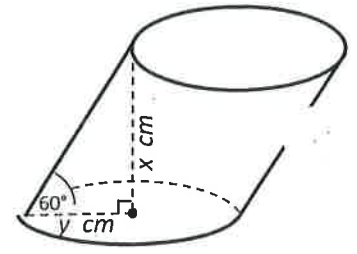
10 is slant height
 $6^2 + b^2 = 10^2$
 $36 + b^2 = 100$
 $b^2 = 64$
 $b = 8$

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



Cylinder A



Cylinder B

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

- A. $x^{5/2}$
- B. $\sqrt{x^5}$
- C. $\frac{1}{\sqrt{x^5}}$
- D. $\frac{1}{x\sqrt{x}}$

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

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

- A. $\sqrt{3}$
- B. $2\sqrt{6}$
- C. $5\sqrt{3}$
- D. $-\sqrt{3}$

put in calc.

Mock EOCT
 multiply exponents

30. Which expression is equivalent to $\sqrt[3]{64x^7}$?

$\sqrt[3]{64} \sqrt[3]{x^{6/7}} = 4(x^{6/7})^{1/3}$
 $= 4x^{6/21} = 4x^{2/7}$

mmh

A. $4x^{2/7}$

B. $4x^{18}$

C. $64x^{2/7}$

D. $64x^{18}$

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

A. $\sqrt{10} + 11$

B. $3(\sqrt{3} + \sqrt{5})$

C. $\sqrt{9} + \sqrt{16}$

D. $\sqrt{7} + 2$

14.16227766

11.90435636

7

4.645751311

mmh

32. Let a be a nonzero rational number and b be an irrational number. Which of these expressions MUST be a rational number?

$a = 7$
 $b = \sqrt{3}$

pick your own a and b values

A. $b + 0$

B. $a + a$
 $7 + 7 = 14$

C. $a + b$
 $7 + \sqrt{3} = \text{crazy dec.}$

D. $b + b$
 $\sqrt{3} + \sqrt{3} = 2\sqrt{3}$

crazy dec.

33. A model of a house is shown. What is the perimeter, in units, of the model?

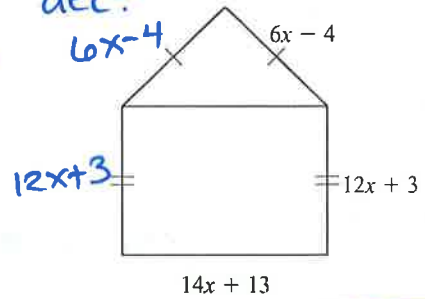
distance around.

A. $32x + 12$

C. $50x + 11$

B. $46x + 25$

D. $64x + 24$



Add All UP

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?

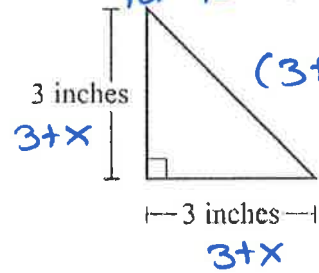
rule = leg($\sqrt{2}$) for 45-45-90 A's.

A. $18 + x$

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

B. $(x + 3)^2$

D. $3\sqrt{2} + x$



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

A. $-2i$

B. -2

C. 2

D. $2i$

$-i^9 + i^3$
 $-(i) - i = -2i$

$i^2 = -1$
 $i^3 = -i$
 $i^4 = 1$

- E 36. Which has the same value as $(5 - 3i)(-4 + 2i)$?
- $-20 + 10i + 12i - 6i^2$
 $-20 + 22i + 6$
 $-14 + 22i$
- A. $-26 - 2i$ B. $-26 + 22i$ C. $-14 - 2i$ D. $-14 + 22i$

- E 37. What are the solutions to the equation $2x^2 + 3x + 9 = 0$?
- $a=2 \quad b=3 \quad c=9$
 $x = \frac{-3 \pm \sqrt{(3)^2 - 4(2)(9)}}{2(2)} = \frac{-3 \pm \sqrt{63}}{4}$
 $= \frac{-3 \pm 3i\sqrt{7}}{4}$
- 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. $x = -\frac{3}{4} \pm \frac{3i\sqrt{7}}{4}$

- E 38. Given the expression $2n^2 - n - 3$, what is the coefficient of the n term? # in front of variable
- A. 1 B. -1 C. 2 D. -3

- E 39. Which expression is equivalent to $121x^4 - 64y^6$? take $\sqrt{\quad}$
- A. $(11x^2 - 16y^2)(11x^2 + 16y^2)$ C. $(11x^2 + 8y^2)(11x^2 + 8y^2)$ $++ = \oplus$
- B. $(11x^2 - 16y^3)(11x^2 - 16y^3)$ D. $(11x^2 + 8y^3)(11x^2 - 8y^3)$ $+ - = \ominus$
- " \downarrow 8 need (-)

- H 40. Given the expression $6a^2 + 7a - 3$, which of the following is a factor of the expression?
- $(3a-1)(2a+3)$
- ★ A. $(3a - 1) \quad x = 1/3$ B. $(2a - 3) \quad x = 3/2$ C. $(6a + 1) \quad x = -1/6$ D. $(2a - 1) \quad x = 1/2$
- Haven't learned but could test zeros.

- E 41. What is the vertex of the graph of $f(x) = x^2 + 10x - 9$? use calc & find symmetry
- A. (5, 66) B. (5, -9) C. (-5, -9) D. (-5, -34)

- H 42. 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

$V = 3, 13$
 $y = -2(x-3)^2 + 13$
 \downarrow
 $a-5$

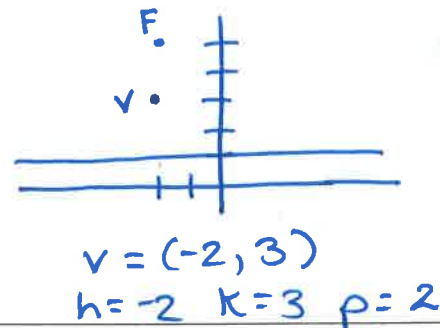
$\frac{a-5=13}{+5 \quad +5}$
 $a = 18 \text{ b/c}$
 $18-5=13$

$$y - k = \frac{1}{4p} (x - h)^2$$

H

43. Determine the equation of the parabola with a focus at (-2,5) and a diretrix of y=1.

- A. $(x + 2)^2 = 8(y - 3)$
- B. $(x - 2)^2 = 8(y - 3)$
- C. $(x + 2)^2 = 8(y + 3)$
- D. $(x - 2)^2 = 8(y + 3)$



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

$$8(y - 3) = (x + 2)^2$$

m

44. 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?

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

x = items sold y = profit

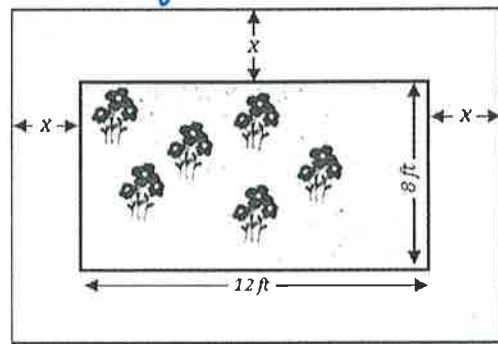
Look for y = 0 on table

or do Quad. Form to get solutions

H

45. 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?

- A. 2 feet
4 on each side
- B. 3.5 feet
7 on each side
- C. 4 feet
8 on each side
- D. 6 feet
12 on each side



m

46. The formula for the surface area of a cone is $SA = \pi r^2 + \pi r s$. Which equation shows the formula in terms of s?

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

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

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

m

47. What are the solutions to the equation $2x^2 - 2x = 12$?

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

$$2x^2 - 2x - 12 = 0$$

$$a = 2 \quad b = -2 \quad c = -12$$

$$x = \frac{2 \pm \sqrt{(-2)^2 - 4(2)(-12)}}{2(2)}$$

$$= \frac{2 \pm \sqrt{100}}{4} = \frac{2 \pm 10}{4}$$

$$x = \frac{12}{4} = 3 \quad x = \frac{-8}{4} = -2$$

FRUIT

48. What are the solutions of this system of equations?

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

$$y = 12x - 6$$

- A. (0, 6) and (1, -6)
- B. (0, -6) and (1, -6)
- C. (0, -6) and (1, 6)
- D. (-6, 0) and (6, 1)

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

$$5x^2 - 5x = 0$$

$$a = 5 \quad b = -5 \quad c = 0$$

$$x = \frac{0 \pm \sqrt{(-5)^2 - 4(5)(0)}}{2(5)}$$

$$x = \frac{0 \pm \sqrt{25}}{10}$$

$$x = \frac{0 \pm 5}{10}$$

$$12(0) - 6 = -6$$

$$12(1) - 6 = 6$$

$$x = \frac{5 \pm \sqrt{(-5)^2 - 4(5)(0)}}{2(5)}$$

$$= \frac{5 \pm \sqrt{25}}{10} = \frac{5 \pm 5}{10}$$

$$\frac{0}{10} = 0$$

$$\frac{10}{10} = 1$$

E 49. Use the table to answer the question. What is the average rate of change of $f(x)$ over the interval $-2 \leq f(x) \leq 0$?

x	f(x)
-2	15
-1	9
0	5
1	3
2	3

A. -10

C. 5

$$= \frac{-6 + -4}{2}$$

B. -5

D. 1

$$= \frac{-10}{2} = -5$$

E 50. 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.

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

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

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



M 51. Given that line m is parallel to line n , find the value of x that makes the diagram true

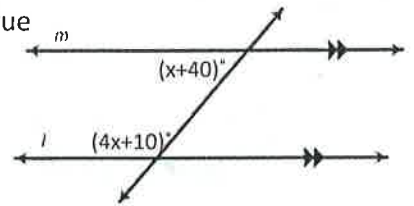
A. $x = 10$

C. $x = 30$

$$\begin{aligned} x + 40 + 4x + 10 &= 180 \\ 5x + 50 &= 180 \\ 5x &= 130 \\ \frac{5x}{5} &= \frac{130}{5} \\ x &= 26 \end{aligned}$$

B. $x = 26$

D. $x = 22$



HH
H 52. 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 $g(x)$?

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	f(x)	g(x)
0	0	-10
1	2	-9
2	4	-6
3	6	-1
4	8	6
...	10	15

12 < 15
look at 36 + 11 trending

M 53. 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)

$$\begin{aligned} x^2 - 10x + 25 + y^2 + 0y + 0 &= 11 + 25 + 0 \\ (x - 5)^2 + (y + 0)^2 &= 36 \\ C &= (5, 0) \quad r = 6 \end{aligned}$$

$$y - k = \frac{1}{4p}(x - h)^2$$

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

$V = (4, -3)$
 $p = 2$

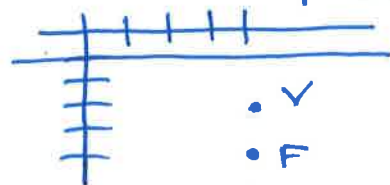
EM

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

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

parabola opens down

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



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

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

E

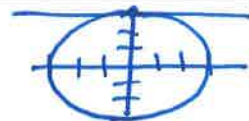
55. A circle is centered at the origin and has a radius of 3 units. A horizontal line passes through the point $(0, 3)$. In how many places does the line intersect the circle?

A. 0

B. 1

C. 2

D. Infinitely many



E

56. Which statement BEST describes the graph of $f(x + 6)$?

HS

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

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

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

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

EM

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

A. Incenter *angle bisectors*

C. Centroid *medians*

B. Orthocenter *altitudes*

D. Circumcenter *perp. bisectors*

E

58. Which students would be members of the group $(A \cap B)'$?

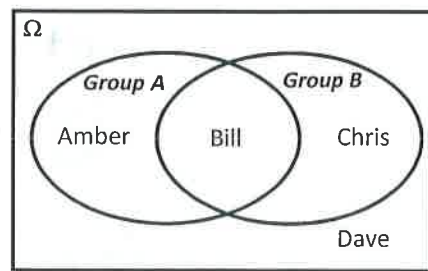
- And

A. {Amber, Chris}

C. {Dave}

B. {Bill}

D. {Amber, Chris, Dave}



E

59. 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 represent 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.

And

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



60. 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, given that the person selected is male?

	Hair Color		
	Brown	Blonde	Red
Male	548	876	82
Female	612	716	66

A. 0.51

C. 0.58

$$\frac{876}{1506} = .58$$

B. 0.55

D. 0.63

61. 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

$$\frac{.46}{.72} = .638$$

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

A. 0.26

B. 0.33

C. 0.57

D. 0.64

62. 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. $\frac{8}{13}$

26 black 26 red 52 total

$$= \frac{26}{52} + \frac{2}{52} + \frac{2}{52} - \frac{2}{52}$$

duplicates

$$= \frac{7}{13}$$