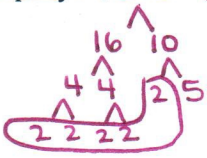
**Secondary Math 2** **End of Year Review** **Name:** Key **Period:** _____

Answer each question thoroughly.

## EOYR Part 1 – The Number System

1) Simplify: $\sqrt[5]{160}$




$= 2\sqrt[5]{5}$

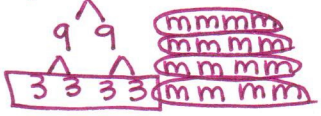
2) Rewrite in exponential form.

$\sqrt[5]{x^3} = x^{\frac{3}{5}}$

3) Simplify.

$(81m^{16})^{3/4}$

$(\sqrt[4]{81m^{16}})^3 = (3m^4)^3$




$= 27m^{12}$

4) Simplify.

$(2b^{-4/3}c^{2/5})^{-3}$

$= 2^{-3} b^{-\frac{4}{3}\cdot\frac{-3}{1}} c^{\frac{2}{5}\cdot\frac{-3}{1}}$

$= 2^{-3} \cdot b^4 c^{\frac{-6}{5}} = \frac{1}{2^3} b^4 \frac{1}{c^{\frac{6}{5}}}$

$= \frac{b^4}{8c^{6/5}}$

5) Simplify:

$\sqrt[5]{x^3} \cdot \sqrt[7]{x^{1/2}}$

$= x^{\frac{3}{5}} \cdot (x^{1/2})^{\frac{1}{7}}$

$= x^{\frac{3}{5}} \cdot x^{\frac{1}{14}} = x^{\frac{3}{5}+\frac{1}{14}}$

$= x^{\frac{42}{70}\cdot\frac{5}{70}} = x^{47/70}$

6) Solve:

$x^{3/2} - 5 = 120$

$+5 \quad +5$

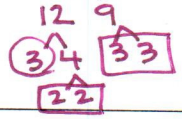
$x^{\frac{3}{2}} = 125$

$\sqrt[3]{(\sqrt{x})^3} = \sqrt[3]{125}$

$(\sqrt{x})^2 = (5)^2$ $\quad x = 25$

7) Simplify: $\sqrt{-25} = i\sqrt{25} = 5i$

8) Simplify: $\sqrt{-108} = i\sqrt{108} = 6i\sqrt{3}$




9) Simplify:

$(2i)(-6i) = -12i^2$ $\quad i^2 = -1$

$= -12(-1)$

$= 12$

10) Simplify:

$(2 + i) - (4 - 3i)$

$= 2 + i - 4 + 3i$

$= -2 + 4i$

11) Simplify the expression and put in standard form:

$(-7x^2 + x^3) - (x^2 + 4x^3 - 7x^4)$

$= -7x^2 + x^3 - x^2 - 4x^3 + 7x^4$

$= 7x^4 - 3x^3 - 8x^2$

12) Simplify the expression and put in standard form:

$(3b + 4)(4b - 5)$

$= 12b^2 - 15b + 16b - 20$

$= 12b^2 + b - 20$

13) Factor out the common factor:
$-72y^3x^3 + 36y^5 + 63y^3$

$-9y^3(8x^3 - 4y^2 - 7)$

14) Factor completely:
$m^2 - 3m - 10$

ac
-10
-2, 5
2, -5
-1, 10
1, -10

$m^2 + 2m - 5m - 10$

$m(m+2) - 5(m+2)$

$(m-5)(m+2)$

15) Factor completely:
$6x^2 - 36x + 30$

ac
5
1, 5
-1, -5

$6(x^2 - 6x + 5)$

$6(x^2 - 1x - 5x + 5)$

$6(x(x-1) - 5(x-1))$

$6(x-1)(x-5)$

16) Factor completely:
$9p^2 - 25$

$a^2 - b^2 = (a+b)(a-b)$

$a = 3p \quad b = 5$

$(3p+5)(3p-5)$

## EOYR Part 2 – Quadratic Functions

17) Solve by factoring:
$(2x + 8)(x - 1) = 0$

$2x + 8 = 0$
$-8 \quad -8$
$\frac{2x}{2} = \frac{-8}{2}$
$x = -4$

$x - 1 = 0$
$+1 \quad +1$
$x = 1$

18) Solve by factoring:
$x^2 + 10x + 21 = 0$

ac
21
7, 3
1, 21

$(x+7)(x+3) = 0$

$x + 7 = 0$
$-7 \quad -7$
$x = -7$

$x + 3 = 0$
$-3 \quad -3$
$x = -3$

19) Solve by taking square roots:
$\sqrt{x^2} = \sqrt{-84}$

$x = \pm\sqrt{-84}$

$x = \pm i\sqrt{84} = \pm 2i\sqrt{21}$

7 12
3 4
2 2

$x = 2i\sqrt{21}$
$x = -2i\sqrt{21}$

20) Solve by completing the square:
$m^2 + 14m + 47 = 0$
$-47 \quad -47$

$m^2 + 14m + \left(\frac{14}{2}\right)^2 = -47 + \left(\frac{14}{2}\right)^2$

$(m+7)^2 = -47 + 49$

$\sqrt{(m+7)^2} = \sqrt{2}$

$m + 7 = \pm\sqrt{2}$
$-7 \quad -7$

$m = -7 \pm \sqrt{2}$

$m = -7 + \sqrt{2}$ | $m = -7 - \sqrt{2}$

21) Solve using the quadratic formula:

Formulas: $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$2x^2 - 9x - 5 = 6$

$-6 \quad -6$

$2x^2 - 9x - 11 = 0$

$a \quad b \quad c$

$x = \frac{+9 \pm \sqrt{(-9)^2 - 4(2)(-11)}}{2(2)}$

$= \frac{9 \pm \sqrt{81+88}}{4} = \frac{9 \pm \sqrt{169}}{4}$

$= \frac{9 \pm 13}{4}$ $\quad x = \frac{9+13}{4}$ $\quad x = \frac{9-13}{4}$

$x = 22/4$ $\quad x = -1$

22) Solve by any method:

$2x^2 - 128 = 0$

$+128 \quad +128$

$\frac{2x^2}{2} = \frac{128}{2}$

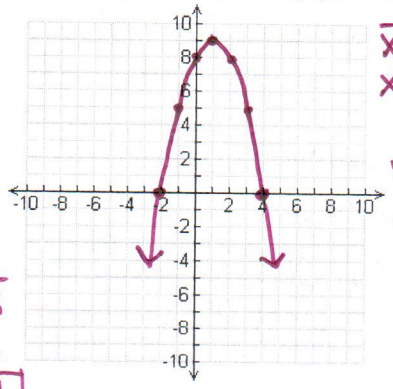
$\sqrt{x^2} = \sqrt{64}$

$x = \pm\sqrt{64}$

$x = 8$ $\quad x = -8$

23) Graph: intercept form

$y = -(x+2)(x-4)$



x-int

$x = -2$

$x = 4$

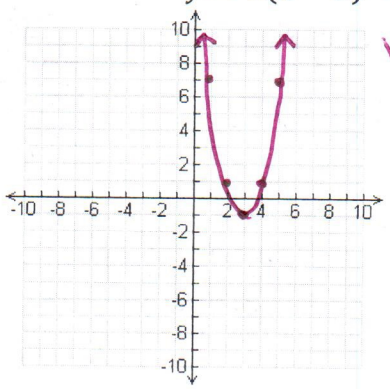
Vertex

$\frac{-2+4}{2} = 1$

| x | y |
|---|---|
| -1 | 5 |
| 0 | 8 |
| 1 | 9 |
| 2 | 8 |
| 3 | 5 |

24) Graph: Vertex form

$y = 2(x-3)^2 - 1$

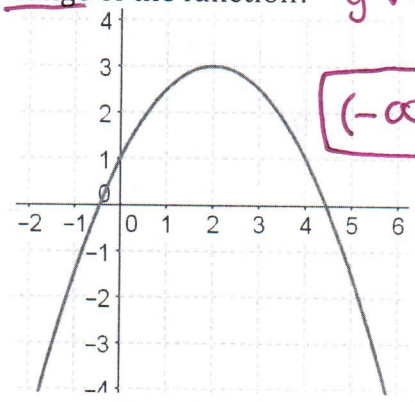


Vertex

(3, -1)

| x | y |
|---|---|
| 1 | 7 |
| 2 | 1 |
| 3 | -1 |
| 4 | 1 |
| 5 | 7 |

25) Given the following graph, what is the range of the function? y-values



$(-\infty, 3]$

26) What is the vertex of

$y = -\frac{1}{2}(x+1)^2 + 2$? vertex form

$(-1, 2)$

27) Is the vertex of $y = 3(x+1)^2 + 1$ a maximum or a minimum?

positive

since 3 is +, the graph opens ∪

so, vertex is a **MINIMUM**

28) What is the axis of symmetry for $y = -(x-5)^2 + 7$?

vertex (5, 7)

so **$x = 5$**

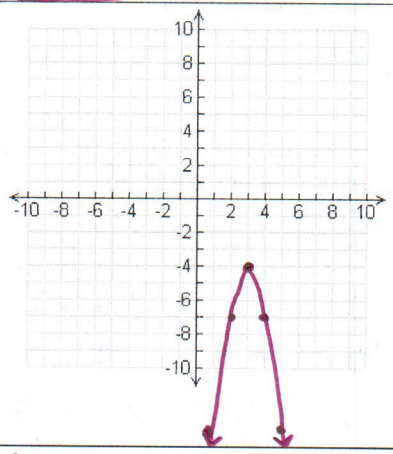
↳ passes through vertex at $x = h$

29) Sketch the graph of the function by making a table of values. Use $x = -\frac{b}{2a}$ as the middle point in your table.

$y = -3x^2 + 18x - 31$

$\frac{-18}{2(-3)} = 3$

| $x$ | $y$ |
|---|---|
| 1 | -16 |
| 2 | -7 |
| **3** | **-4** |
| 4 | -7 |
| 5 | -16 |



30) Find the real roots of the function. If there are no real roots, indicate no solution. FACTOR!

$y = 2x^2 + 4x - 96$

$2(x^2 + 2x - 48) = 0$

ac: $-48$; $-4, 12$; **$8, -6$**; $-2, 24$

$\frac{2(x+8)(x-6)}{2} = \frac{0}{2}$

$(x+8)(x-6) = 0$

$x + 8 = 0$ → **$x = -8$**

$x - 6 = 0$ → **$x = 6$**

31) The path of an arrow can be modeled by $h(t) = -16t^2 + 64t + 6$, where $h(t)$ is the height of the arrow in feet $t$ seconds after being released. When will the arrow hit the ground? $h = 0$ solve for $t$.

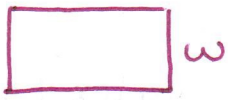
$0 = -16t^2 + 64t + 6$

$t = \frac{-64 \pm \sqrt{64^2 - 4(-16)(6)}}{2(-16)}$

$t = -0.09$ or $t = 4.09$

**$t = 4.09$ seconds**

32) A rectangular porch has an area of 150 square feet. The length of the porch is 5 feet longer than the width. What is the width of the porch?



$w$

$A = 150\ ft^2$

$A = lw$

$l = 5 + w$

$(5+w)(w) = 150$

$5w + w^2 = 150$

$-150 \quad -150$

$w^2 + 5w - 150 = 0$

ac: $-150$; **$-10, 15$**; $-2, 75$

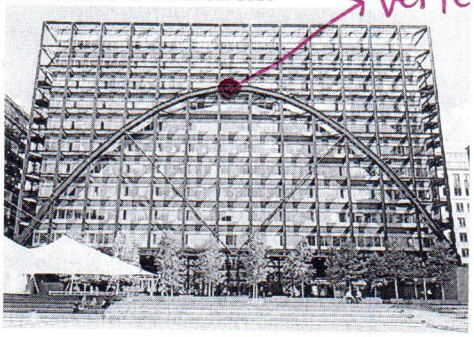
$(w-10)(w+15) = 0$

$w - 10 = 0$ → $+10 \ +10$ → $w = 10$

$w + 15 = 0$ → $-15 \ -15$ → $w = -15$ can't have negative width

**$w = 10$ ft**

33) The Exchange House in London, England, is supported by two interior and two exterior steel arches. The shape of each supporting arch can be modeled by $h(x) = -.025x^2 + 2x$, where $h(x)$ represents the height of the arch in meters and $x$ represents the horizontal distance from one end of the base in meters. How tall is the arch?




$h = \frac{-b}{2a} = \frac{-2}{2(-0.025)} = 40$

$k = -0.025(40)^2 + 2(40)$

$k = 40$

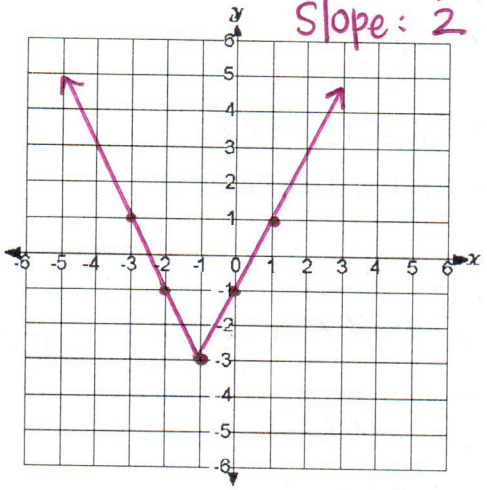
**It is 40 m tall**

34) Graph the function:

$y = 2|x + 1| - 3$

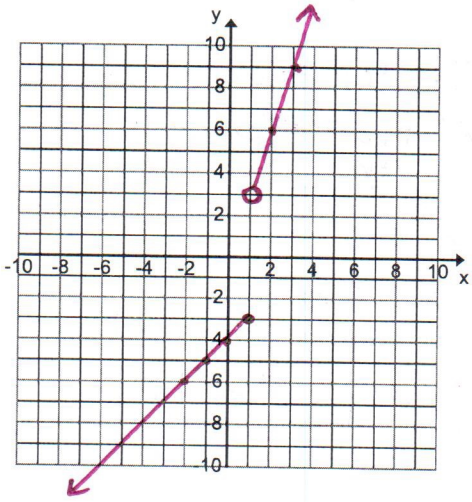
vertex: $(-1, -3)$

slope: 2



35) Graph the piecewise function

$$f(x) = \begin{cases} x - 4, if\ x \le 1 & \text{closed} \\ 3x, if\ x > 1 & \text{open} \end{cases}$$



slope

**EOYR Part 3 – Structures of Expressions**

36) Find the average rate of change for the function over the given interval.

$y = 2x^2 - 5x + 7; [-1, 3]$

$y_1 = 2(-1)^2 - 5(-1) + 7 = 14$

$y_2 = 2(3)^2 - 5(3) + 7 = 10$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{10 - 14}{3 - (-1)}$$

$$m = \frac{-4}{4}$$

$\boxed{m = -1}$

37) Put the equation into vertex form.

$y = 3x^2 + 18x + 24$

$\hookrightarrow y = a(x-h)^2 + k$

$a = 3$

$h = \frac{-b}{2a} = \frac{-18}{2(3)} = -3$

$k = 3(-3)^2 + 18(-3) + 24 = -3$

$\boxed{y = 3(x+3)^2 - 3}$

38) Solve the system of equations. Write your answer(s) as a coordinate pair.

$$\begin{cases} y = \frac{1}{2}x + 2 \\ y = -x - 1 \end{cases}$$

$\frac{1}{2}x + 2 = -x - 1$

$+x \quad +x$

$\frac{3}{2}x + 2 = -1$

$-2 \quad -2$

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

$2\left(\frac{3}{2}x\right) = 2(-3)$

$3x = -6$

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

$x = -2$

$y = -(-2) - 1$

$y = 1$

$\boxed{(-2, 1)}$

39) Solve the system of equations. Write your answer(s) as a coordinate pair.

$$\begin{cases} y = x^2 - 11x + 28 \\ y = -3x + 12 \end{cases}$$

$-3x + 12 = x^2 - 11x + 28$

$+3x \quad -12 \quad +3x \quad -12$

$x^2 - 8x + 16 = 0$

ac: 16; $4, 4$; $-4, -4$; $2, 8$

$(x-4)(x-4) = 0$

$x = 4$

$y = -3(4) + 12$

$y = 0$

$\boxed{(4, 0)}$

40) Solve the system of equations. Write your answer(s) as a coordinate pair.

$\begin{cases} x^2 + y^2 = 25 \\ y = 4 \end{cases}$

$x^2 + (4)^2 = 25$

$x^2 + 16 = 25$

$-16 \quad -16$

$\sqrt{x^2} = \sqrt{9}$

$x = \pm 3$

(3,4) (-3,4)

41) Solve the system of equations. Write your answer(s) as a coordinate pair.

$\begin{cases} x^2 + y^2 = 10 \\ y = x + 4 \end{cases}$

$x^2 + (x+4)^2 = 10$

$x^2 + (x+4)(x+4) = 10$

$x^2 + x^2 + 4x + 4x + 16 = 10$

$2x^2 + 8x + 16 = 10$

$-10 \quad -10$

$2x^2 + 8x + 6 = 0$

$\frac{2(x^2+4x+3)}{2} = \frac{0}{2}$

$x^2 + 4x + 3 = 0$ gc

$(x+1)(x+3) = 0$ 3 1,3

$x+1=0$

$x=-1$

$x+3=0$

$x=-3$

$y = -1+4 = 3$

(-1,3)

$y = -3+4 = 1$

(-3,1)

Use the following functions for the next six problems:

$f(x) = 2x - 7, \quad g(x) = -x + 4, \quad h(x) = 2x^2 - 2$

42) $(f+g)(x)$

$(2x-7)+(-x+4)$

$2x-7-x+4$

$x-3$

43) $(g-f)(x)$

$(-x+4)-(2x-7)$

$-x+4-2x+7$

$-3x+11$

44) $(f \cdot g)(x)$

$(2x-7)(-x+4)$

$= -2x^2 + 8x + 7x - 28$

$= -2x^2 + 15x - 28$

45) $(fg)(3)$

from #44 $(fg)(x) = -2x^2 + 15x - 28$

$(fg)(3) = -2(3)^2 + 15(3) - 28$

$= -2(9) + 45 - 28$

$= -18 + 45 - 28$

$= -1$

46) $(h-g)(2)$

$(h-g)(x) = (2x^2 - 2) - (-x+4)$

$= 2x^2 - 2 + x - 4$

$= 2x^2 + x - 6$

$(h-g)(2) = 2(2)^2 + (2) - 6$

$= 8 + 2 - 6$

$= 4$

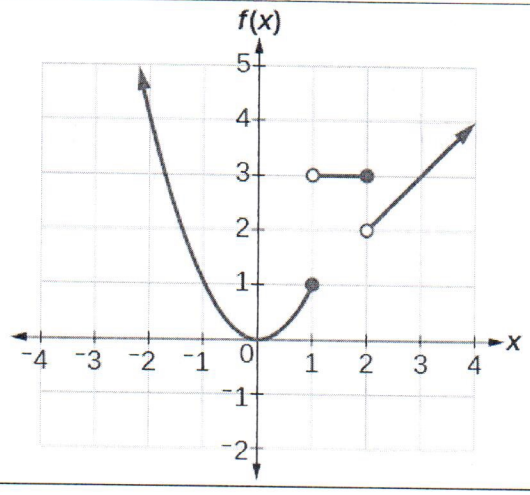
47) $(fh)(x)$

$= (2x-7)(2x^2-2)$

$= 4x^3 - 4x - 14x^2 + 14$

$= 4x^3 - 14x^2 - 4x + 14$

48) Given the graphs of the piecewise functions, evaluate the following.




a) $f(3)$ $x=3$ $y=3$

b) $f(2)$ $x=2$ $y=3$

c) $f(-1)$ $x=-1$ $y=1$

d) What does x equal when $f(x)=4$ $y=4$ $x=-2$, $x=4$

e) What does x equal when $f(x)=0$ $y=0$ $x=0$

f) What does x equal when $f(x)=1$ $y=1$ $x=-1$, $x=1$

49) Evaluate the following Piecewise function given the equation

$$f(x)=\begin{cases} x+5, if\ x\le 3 \\ 2x-1, if\ x>3 \end{cases} \qquad g(x)=\begin{cases} x^2-4, if\ x<10 \\ 5x, if\ x\ge 10 \end{cases}$$

| $f(7)$ | $g(7)$ | $g(10)$ | $f(-2)$ | $f(3)$ |
|---|---|---|---|---|
| $2(7)-1$ $=13$ | $(7)^2-4$ $=45$ | $5(10)$ $=50$ | $(-2)+5$ $=3$ | $(3)+5$ $=8$ |

**EOYR Part 4 – Probability**

Fill out the rest of the table and use the table data to find the probability of the events for the following six questions.

| | Bus | Car | Walk | Total |
|---|---|---|---|---|
| **Male** | 146 | 166 | 82 | 394 |
| **Female** | 154 | 185 | 64 | 403 |
| **Total** | 300 | 351 | 146 | 797 |

50) $P(Bus) = \frac{300}{797}$

51) $P(Male \cap Bus)$ (and) $= \frac{146}{797}$

52) $P(Car \cap Walk)$ (and) Not possible $= \frac{0}{797}$

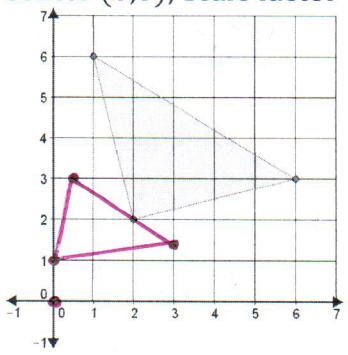
53) $P(Walk \mid Female) = \frac{64}{403}$

54) $P(Male \mid Bus) = \frac{146}{300}$

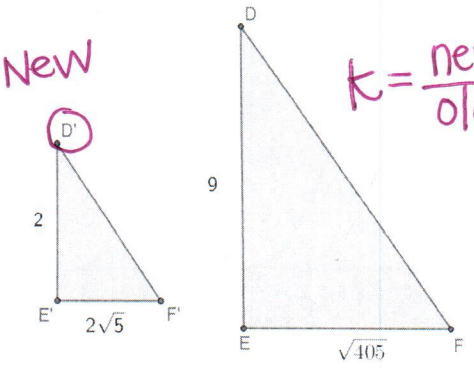
55) $P(Female \cup Walk)$ (or) $= P(F)+P(W)-P(F \cap W)$

$$\frac{403}{797}+\frac{146}{797}-\frac{64}{797}=\frac{613}{797}$$

56) Draw the dilation with Center (0,0); scale factor ½

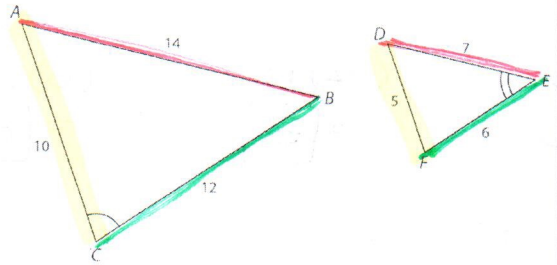


57) Determine the scale factor of the dilation.




$k = \frac{\text{new}}{\text{old}} = \frac{2}{9}$

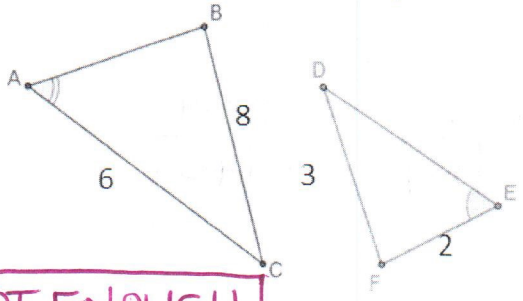
58) Determine if the following triangles are similar. If so, write a similarity statement.




$\frac{10}{5} = \frac{12}{6} = \frac{14}{7} = \frac{2}{1}$

$\triangle ABC \sim \triangle DEF$ by SSS~

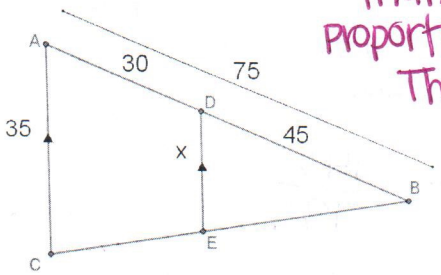
59) Determine if the following triangles are similar. If so, write a similarity statement.




NOT ENOUGH INFO

check
SSS~
SAS~
AA~

60) What is the length of $\overline{DE}$? Triangle Proportionality Thm

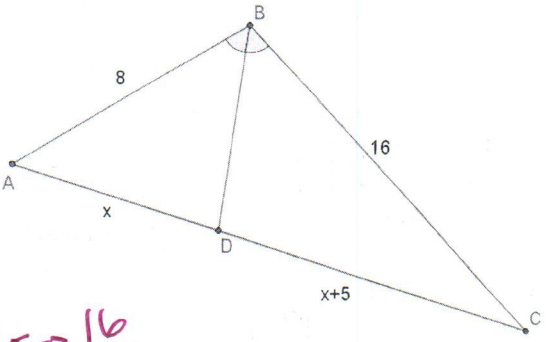



$\frac{75}{45} \times \frac{35}{x}$

$\frac{75x}{75} = \frac{1575}{75}$

$x = 21$

61) Given that $\angle B$ is bisected, what is the length of $\overline{DC}$?




$\frac{8}{x} \times \frac{16}{x+5}$

$8(x+5) = 16x$

$8x + 40 = 16x$

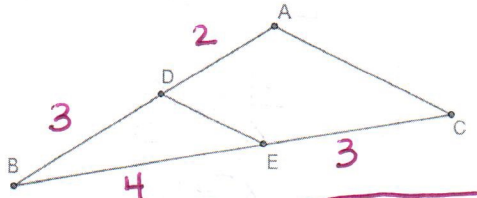
$-8x \quad -8x$

$\frac{40}{8} = \frac{8x}{8}$

$x = 5$ so

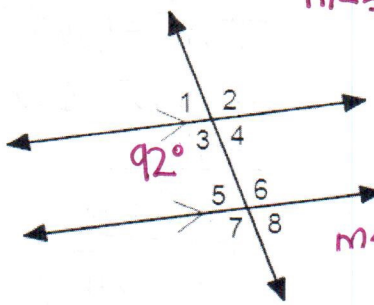
$m\overline{DC} = 10$

62) Given that $AD = 2, DB = 3, CE = 3,$ *and* $BE = 4$. Is $\overline{AC} \parallel \overline{DE}$?




check $\frac{3}{2} \neq \frac{4}{3}$ so NOT PARALLEL

63) Find the measures of the missing angles.
Given: $m\angle 3 = 92$



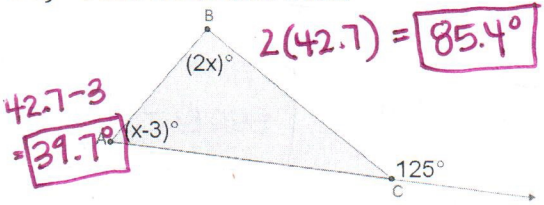

$m\angle 3 \cong m\angle 2 \cong m\angle 6 \cong m\angle 7 = 92°$

$\angle 1 + \angle 3 = 180°$

so $m\angle 1 = 88°$

$m\angle 1 \cong m\angle 4 \cong m\angle 8 \cong m\angle 5 = 88°$

64) Find $m\angle A$ and $m\angle B$




$2(42.7) = 85.4°$

$42.7 - 3 = 39.7°$

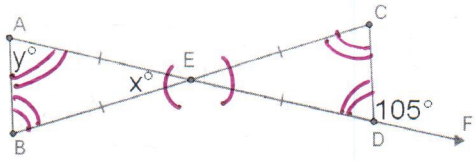
$2x + x - 3 = 125°$

$3x + 3 = 125$

$-3 \quad -3$

$\frac{3x}{3} = \frac{128}{3}$ $x = 42.7$

65) Find $x$ and $y$




$\angle D = 180 - 105$

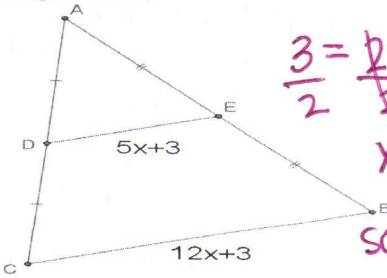
$\angle D = 75°$

so $y = 75°$

$180 - 75 - 75 = x$

$x = 30°$

66) Given that $\overline{DE}$ is a midsegment. Find the length of $\overline{DE}$




$2(5x+3) = 12x+3$

$10x + 6 = 12x + 3$

$-10x \quad -3 \quad -10x \quad -3$

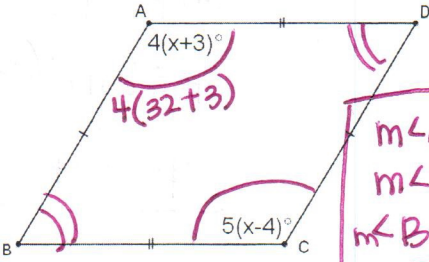
$\frac{3}{2} = \frac{2x}{2}$

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

so $DE = 5(\frac{3}{2}) + 3$

$= 10.5$

67) Find $m\angle A, m\angle B, m\angle C$ and $m\angle D$




$\angle A + \angle B = 180°$

$4(x+3) = 5(x-4)$

$4x + 12 = 5x - 20$

$-4x \quad +20 \quad -4x \quad +20$

$32 = x$

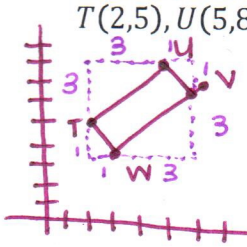
$m\angle A = 140°$

$m\angle C = 140°$

$m\angle B = 40°$

$m\angle D = 40°$

68) Determine whether the given vertices form a parallelogram.
$T(2,5), U(5,8), V(6,7),$ *and* $W(3,4)$



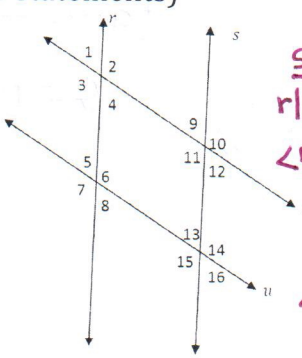

2 sets of parallel lines

so

yes, a parallelogram

69) Given that $r \parallel s$ and $t \parallel u$, prove that $\angle 5 \cong \angle 12$ (Remember to give reasons for your statements)

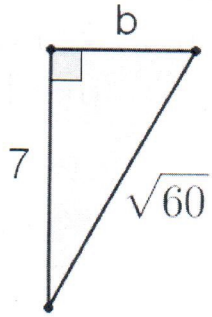
one way:




| statement | reason |
|---|---|
| $r \parallel s, t \parallel u$ | given |
| $\angle 5 \cong \angle 1$ | corresponding angles |
| $\angle 1 \cong \angle 12$ | alt. ext. angles |
| $\angle 5 \cong \angle 12$ | substitution |

$a^2+b^2=c^2$ SOH CAH TOA

70) Find the missing side.




$7^2+b^2=(\sqrt{60})^2$

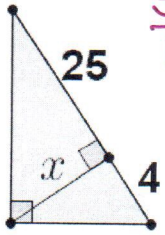
$49+b^2=60$

$-49 \quad -49$

$\sqrt{b^2}=\sqrt{11}$

$b=\sqrt{11}$

71) Find $x$.



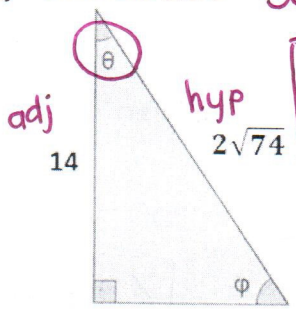

$\frac{SL}{LL}=\frac{SL}{LL}$

$\frac{4}{x}=\frac{x}{25}$

$\sqrt{x^2}=\sqrt{100}$

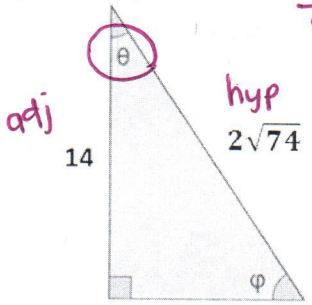
$x=10$

72) Find the $\sin\theta$ SOH



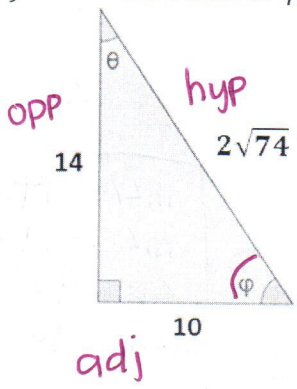

$\sin\theta=\frac{10}{2\sqrt{74}}$

73) Find the $\sec\theta$ $=\frac{hyp}{adj}$




$\sec\theta=\frac{2\sqrt{74}}{14}$

74) Find the value of $\varphi$

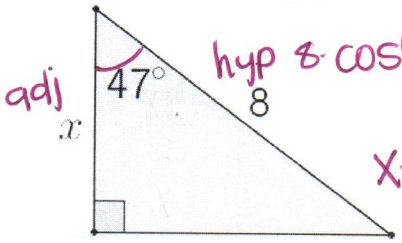



$\tan\phi=\frac{14}{10}$

$\phi=\tan^{-1}\left(\frac{14}{10}\right)$

$\phi=54.5°$

75) What is the value of $x$, to the nearest hundredth? CAH

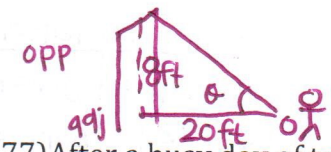



$\text{hyp}\cdot\cos47°=\frac{x}{8}\cdot 8$

$x=8\cos47°$

$x=5.46$

76) Will stands 20 feet away from a soccer goal. The upper cross-bar of the goal is 8 feet above the ground. Will is capable of kicking the soccer ball so fast, that the ball travels in a straight line (considering this means the ball is no longer influenced by gravity, this is exceptionally cool). At what angle of elevation (to the nearest hundredth) must Will kick the ball in order to hit the upper cross-bar?

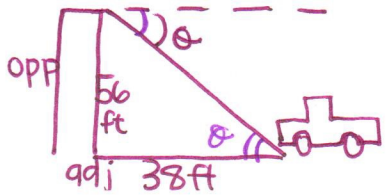



$\tan\theta=\frac{8}{20}$

$\theta=\tan^{-1}\left(\frac{8}{20}\right)$

$\theta=21.8°$

77) After a busy day of teaching math at Orem High School, Mr. Gilchrist doesn't want to wait patiently behind the students as they slowly walk down the stairs. So, he installs a zip-line cable from the corner of the building, which is 56 ft tall to the ground by his reserved parking space, which is 38 ft from the building. From the corner of the building where the cable connects to the building, what is the angle of depression (to the nearest hundredth) of the zip-line?

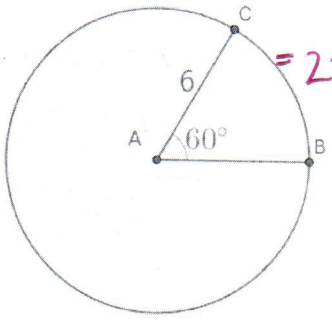



$\tan\theta=\frac{56}{38}$

$\theta=\tan^{-1}\left(\frac{56}{38}\right)$

$\theta=55.84°$

78) Find the length of the arc. $AL = 2\pi r \cdot \frac{\theta}{360}$



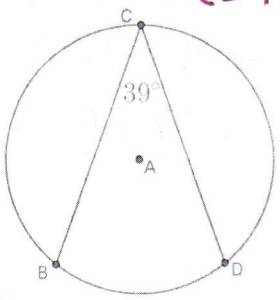

$= 2\pi(6)\left(\frac{60}{360}\right)$

$= 2\pi$

79) What type of angle is $\angle BCD$?

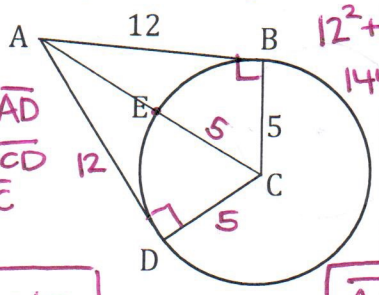
Central Inscribed

$m\widehat{BD} = ?$ $2(39°) = 78°$




80) Find AD and Find AE

Assume that lines that appear to be tangent are tangent.




$\overline{AB} \cong \overline{AD}$

$\overline{CB} \cong \overline{CD}$

$\cong \overline{EC}$

$12^2 + 5^2 = \overline{AC}^2$

$144 + 25 = \overline{AC}^2$

$169 = \overline{AC}^2$

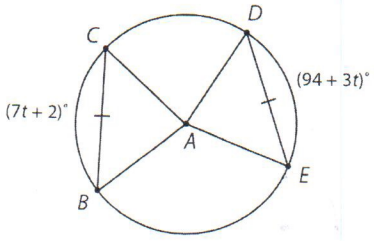
$\overline{AC} = 13$

$13 - 5 = 8$

$\overline{AD} = 12$

$\overline{AE} = 8$

81) Find the value of $t$.




$7t + 2 = 94 + 3t$

$-3t \quad -3t$

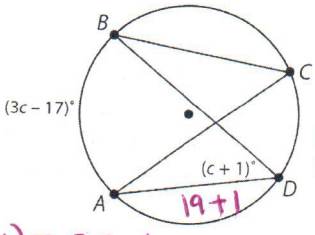
$4t + 2 = 94$

$-2 \quad -2$

$\frac{4t}{4} = \frac{92}{4}$

$t = 23$

82) Find $m\angle C$ and $m\angle D$.




$\angle D \cong \angle C$

$\angle D = 20°$

$\angle C = 20°$

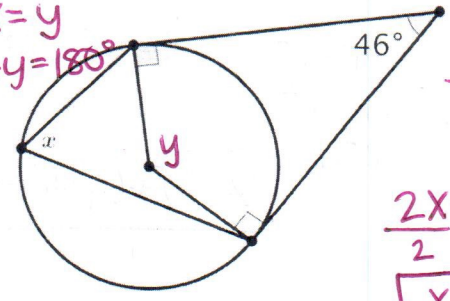
$2(c+1) = 3c - 17$

$2c + 2 = 3c - 17$

$-2c \quad +17 \quad -2c \quad +17$

$19 = c$

83) Solve for x:




$2x = y$

$46 + y = 180°$

$46 + y = 180°$

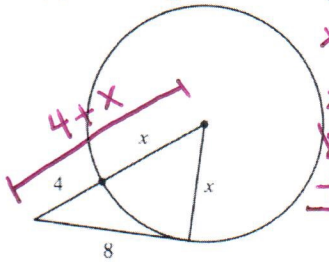
$-46 \quad -46$

$y = 134°$

$\frac{2x}{2} = \frac{134°}{2}$

$x = 67°$

84) Solve for x. Assume that lines which appear tangent are tangent.




$x^2 + 8^2 = (4+x)^2$

$x^2 + 64 = (x+4)(x+4)$

$x^2 + 64 = x^2 + 8x + 16$

$-x^2 \quad -x^2$

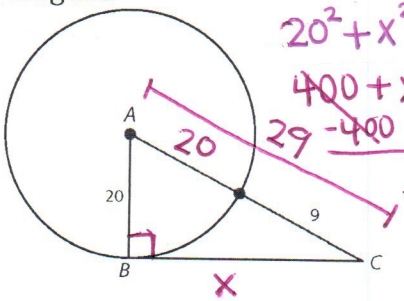
$64 = 8x + 16$

$-16 \quad -16$

$\frac{48}{8} = \frac{8x}{8}$

$x = 6$

85) What is the length of $\overline{BC}$? Assume that lines that appear to be tangent to the circle are tangent.




$20^2 + x^2 = 29^2$

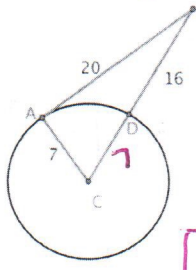
$400 + x^2 = 841$

$-400 \quad -400$

$\sqrt{x^2} = \sqrt{441}$

$x = 21$

86) Determine if line AB is tangent to the circle. check if $a^2+b^2=c^2$



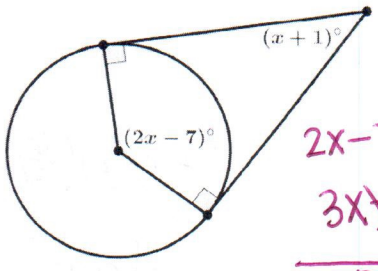

$7^2+20^2=23^2$

$49+400=529$

$449 \neq 529$

NOT TANGENT

87) Solve for x.




$2x-7+x+1=180$

$3x-6=180$

$+6 \quad +6$

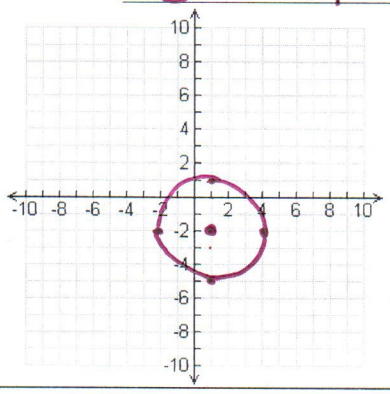
$\frac{3x}{3}=\frac{186}{3}$ $x=62$

88) Identify the center and radius. Then sketch the graph.

$(x-1)^2+(y+2)^2=9$

Center: (1, −2)

Radius: 3 $\sqrt{9}$

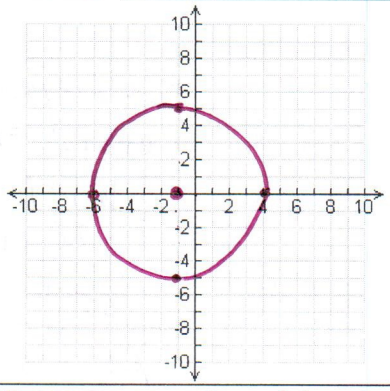


89) Identify the center and radius. Then sketch the graph.

$(x+1)^2+y^2=25$

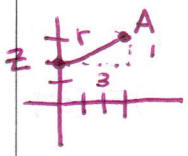
Center: (−1, 0)

Radius: 5 $\sqrt{25}$



90) Point $A(3,3)$ is on circle $Z$, which has center $Z(0,2)$. (h, k)

Write the equation of the circle.




$3^2+1^2=r^2$

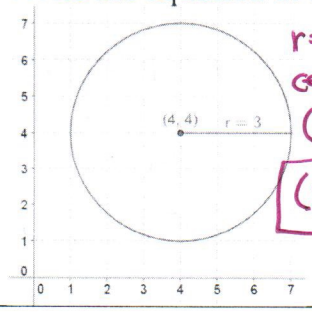
$9+1=r^2$

$r^2=10$ so

$(x-h)^2+(y-k)^2=r^2$

$(x-0)^2+(y-2)^2=10$

91) Write the equation of the circle.




r=3 so $r^2=9$

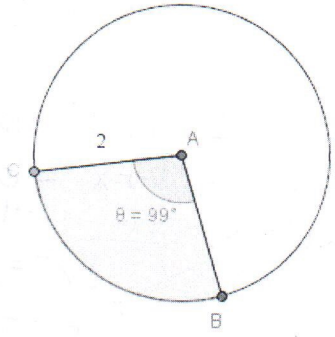
center

(4, 4)

$(x-4)^2+(y-4)^2=9$

92) Find the area of the sector.

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




$=\pi(2)^2\left(\frac{99}{360}\right)$

$=3.46 \text{ units}^2$