College Review Math
Final Exam Review Sheet

Name Key

Use the coordinates of segment $\overline{AB}$; A(-4, 9) & B(2, 7) to find…

1) Distance between A&B (simplest radical form)

$= \sqrt{(2+4)^2 + (7-9)^2}$

$= \sqrt{36+4}$

$= \sqrt{40} = 2\sqrt{10}$

2) Midpoint of $\overline{AB}$

$= \left(\frac{-4+2}{2}, \frac{9+7}{2}\right)$

$= (-1, 8)$

3) Slope of $\overline{AB}$

$m = \frac{7-9}{2+4}$

$= \frac{-2}{6} = -\frac{1}{3}$

Use the function; $f(x) = 2x^2 - 5x + 6$ to find…

4) f(-4)

$= 2(-4)^2 - 5(-4) + 6$

$f(-4) = 58$

5) $f(\sqrt{3})$

$= 2(\sqrt{3})^2 - 5(\sqrt{3}) + 6$

$= 6 - 5\sqrt{3} + 6$

$f(\sqrt{3}) = 12 - 5\sqrt{3}$

6) f(2 – 5i)

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

$f(2-5i) = -46 - 15i$

7) its zero

$0 = 2x^2 - 5x + 1$

$x = 1.3 \pm 1.2i$

Solve the following equations by factoring, the quadratic formula, the rational root theorem (p's & q's) or any other methods we've discussed this year.

8) $2x^2 + 12x - 1 = 21$

$2x^2 + 12x - 22 = 0$

$x = 1.5, -7.5$

9) $3x^3 - 5x^2 + 12x - 20 = 0$

$3x^3 + 12x - 5x^2 - 20 = 0$

$3x(x^2+4) - 5(x^2+4) = 0$

$(3x-5)(x^2+4) = 0$

$x = 5/3, \; x = \pm 2i$

10) $x^3 + 7x^2 = 36$

$x^3 + 7x^2 + 0x - 36 = 0$

FIND P's & Q's

-6	1	7	0	-36
		-6	-6	36
	1	1	-6	0

$x^2 + x - 6 = 0$

$(x+3)(x-2) = 0$

$x = -3, \; x = 2, \; x = -$

Use the inequality; $y > x^2 - 16x + 63$ to answer…

11) What is the vertex?

$x = \frac{-b}{2a}$

$= \frac{16}{2}$

$= 8$

$y = (8)^2 - 16(8) + 63$

$= -1$

$(8, -1)$

12) What are the x-intercepts?

$0 = x^2 - 16x + 63$

$0 = (x-9)(x-7)$

$x = 9, \; x = 7$

13) Describe the shape of the graph, and how it would differ from the graph of $y = x^2 - 16x + 63$.

U - SHAPE (PARABOLA)

SHADED ABOVE W/ DASHED LINE

Find the equation of the line described.

14) Passes thru (-1, 5) and is perpendicular to the line with equation $3x - 6y = 11$

$-6y = 11 - 3x$

$y = -\frac{11}{6} + \frac{1}{2}x$ ← USE -2 FOR SLOPE

$y = -2x + b$

$5 = -2(-1) + b$

$5 = 2 + b$

$3 = b$

$y = -2x + 3$

15) Has roots of $-2 \pm \sqrt{5}$
(hint: use sum & product of roots formulas)

SUM: $-2+\sqrt{5} + -2-\sqrt{5} = -\frac{4}{1}$

PROD: $(-2+\sqrt{5})(-2-\sqrt{5})$

$= 4 - 5 = -\frac{1}{1}$

$1x^2 + 4x - 1 = 0$

Solve the inequalities (you will need to use "sign-analysis" on #18).

16) $18 - (4x + 11) \le 2(7 - 2x)$

$18 - 4x - 11 \le 14 - 4x$

$7 - 4x \le 14 - 4x$

$7 \le 14$

ALL REAL NOS

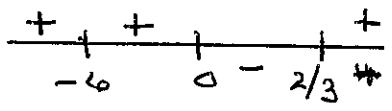
17) $|7 - 3y| > 28$

$7 - 3y > 28$ OR $7 - 3y < -28$

$-3y > 21$ $\quad -3y < -35$

$y < -7$ OR $y > 35/3$

18) $x(x+6)^2(3x-2) \ge 0$



TEST (-7)

$(-7)(-7+6)^2(3\cdot-7-2)$

$(-)(+)(-) = (+)$

$x \le 0$ OR $x \ge 2/3$

Name the domain for…

19) $g(x) = 2|x + 9| - 1$

~~XXXXXX~~

ALL REAL NOS

20) $f(x) = \frac{3}{x^2 - 16}$ $(x-4)(x+4)$

ALL REAL NOS,

$x \neq \pm 4$

21) $h(x) = \sqrt{x - 12}$

$x \ge 12$

For #22-25 use the following functions: $f(x) = \frac{1}{2}x - 8$ $\quad g(x) = x^3 - 2x + 1$ $\quad h(x) = 2x^2$ to find…

22) $(h \cdot g)(x)$

$2x^2(x^3 - 2x + 1)$

$= 2x^5 - 4x^3 + 2x$

23) $(h \circ f)(x)$

$2(\frac{1}{2}x - 8)^2$

$2(\frac{1}{2}x - 8)(\frac{1}{2}x - 8)$

$2(\frac{1}{4}x^2 - 8x + 64)$

$= \frac{1}{2}x^2 - 16x + 128$

24) $g(h(f(12)))$

$f(12) = -2$

$h(-2) = 8$

$g(8) = 497$

$g(h(f(12))) = 497$

25) $f^{-1}(x)$

$y = \frac{1}{2}x - 8$

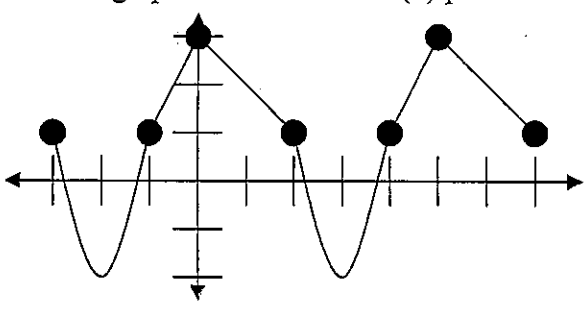
$x = \frac{1}{2}y - 8$

$x + 8 = \frac{1}{2}y$

$2x + 16 = y$

$f^{-1}(x) = 2x + 16$

Use the graph of the function f(x) pictured below to answer the following…



26) The amplitude? $5 \div 2 = 2.5$

27) The period? 5

28) f(100) $= f(0) = 3$

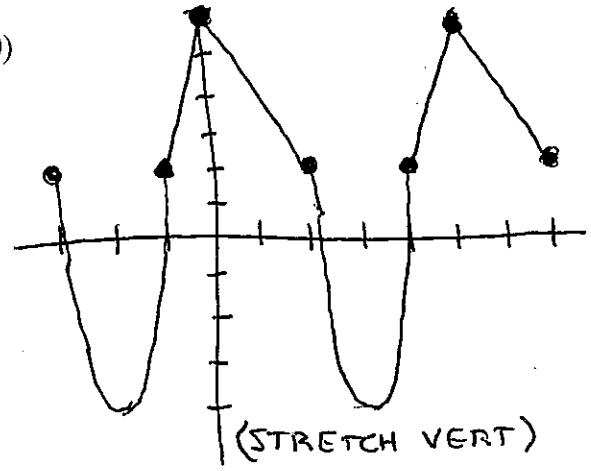
29) f(-98) $= f(-3) = 1$

On the next page, sketch…

30) 2f(x)

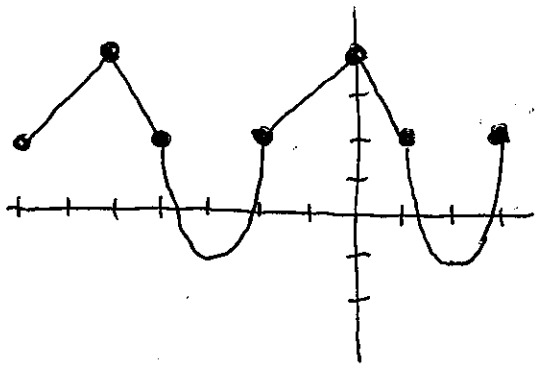
31) f(-x) + 1

30)



(STRETCH VERT)

31)



(REFLECT OVER Y-AXIS, UP 1)

Given the equation of a circle: $(x+6)^2+(y-3)^2=32$, find…

32) The center of the circle.

$(-6,3)$

33) The radius of the circle. (simplest radical form)

$r^2 = 32$

$r = \sqrt{32}$

$r = 4\sqrt{2}$

Given the equation of a hyperbola: $\frac{x^2}{9}-\frac{y^2}{4}=1$, find…

33) The equations of the asymptotes.

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

$a^2 = 9 \quad b^2 = 4$

$a = 3 \quad b = 2$

34) The coordinates of the foci.

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

$c^2 = 9 + 4$

$c^2 = 13$

$c = \sqrt{13}$

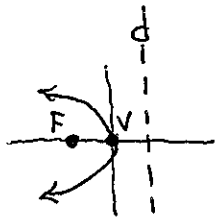
Foci

$(-\sqrt{13},0)$ & $(\sqrt{13},0)$

Given the equation of the equation of a parabola: $x = -\frac{1}{8}y^2$, find…

35) The vertex.

$(0,0)$



36) The directrix.

$\frac{1}{4p} = \frac{1}{8}$

$4p = 8$

$p = 2$

$x = 2$

37) Which way does the graph open (up, down left or right)?

LEFT

38) The following equation is that of an ellipse. Change it into standard form. $\frac{(x-h)^2}{a}+\frac{(y-k)^2}{b}=1$

$y^2 + 5x^2 + 6y - 10x + 9 = 0$

$5x^2 - 10x + y^2 + 6y + 9 = 0$

$5x^2 - 10x + (y+3)^2 = 0$

$x^2 - 2x + \_\_\_ + \frac{(y+3)^2}{5} = 0$

$x^2 - 2x + 1 + \frac{(y+3)^2}{5} = 1$

$(x-1)^2 + \frac{(y+3)^2}{5} = 1$

Round any remaining answers (if necessary) to nearest tenths.

39) Name a positive coterminal angle for -907°.

$+360°$
$+360°$
$+360°$
$173°$

40) Convert 201° 55" to radians.

$\left(201 + \frac{55}{3600}\right) \cdot \frac{\pi}{180}$

$= 3.5$

41) Find the arc length in a circle with radius 12cm cut by a central angle with a measure of 1.75radians.

$s = 12(1.75)$

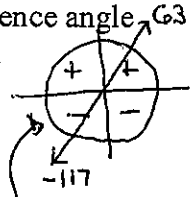
$= 21\text{cm}$

42) Find the area of a sector of a circle with radius of 22 inches cut by a 115° central angle.

$K = \frac{115}{360}\pi(22)^2$

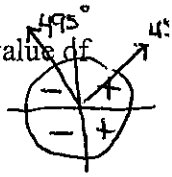
$= 485.7\text{ in}^2$

43) Name the reference angle for sin(-117°).



$+360°$
$= \sin 243°$
-180
$= \sin 63°$ ADJUST SIGN $= -\sin 63°$

44) Find the exact value of cos 495°.

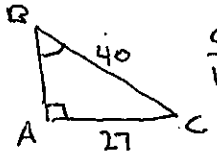


$-360°$
$= \cos 135°$

$180 - 135 = \cos 45°$

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

45) Given ΔABC with $\angle A = 90°$, $a = 40$, $b = 27$, find $\angle B$.

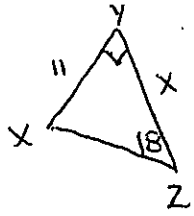


$\frac{\text{OPP}}{\text{HYP}}$ $\sin B = \frac{27}{40}$

$B = \sin^{-1}(27/40)$

$B = 42.5°$

46) Given ΔXYZ with $\angle Y = 90°$, $z = 11$, $\angle Z = 18°$, find x.

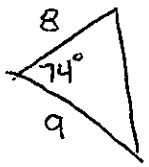


$\frac{\text{OPP}}{\text{ADJ}}$ $\tan 18° = \frac{11}{x}$

$x = \frac{11}{\tan 18°}$

$x = 33.9$

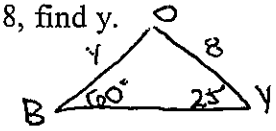
47) Find the area of a triangle with sides 9cm and 8cm in length with an included angle of 74°.



$K = \frac{1}{2}(8)(9)\sin 74°$

$K = 34.6\text{ cm}^2$

48) Given ΔBOY where $\angle B = 60°$, $\angle Y = 25°$, $b = 8$, find y.

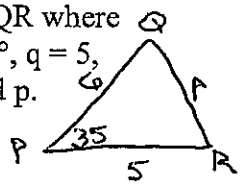


$\frac{\sin 60°}{8} = \frac{\sin 25°}{y}$

$y \sin 60° = 8 \sin 25°$

$y = \frac{8 \sin 25°}{\sin 60°} = 3.9$

49) Given ΔPQR where $\angle P = 35°$, $q = 5$, $r = 6$, find p.



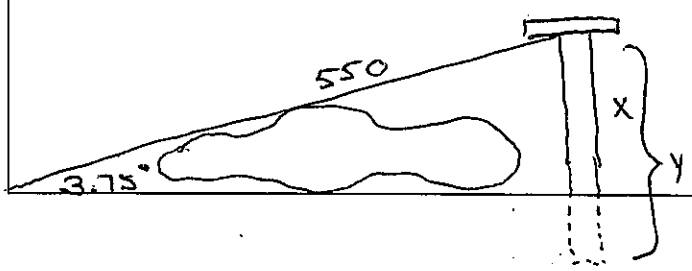
$p^2 = 5^2 + 6^2 - 2(5)(6)\cos 35°$

$p^2 = 61 - 60\cos 35°$

$p = \sqrt{61 - 60\cos 35°}$

$p = 3.4$

50) A 550 foot zip line anchored in the ground extends upward across a pond to a platform on the opposite side of the pond. The zip line rises at an angle of 3.75°. If the pillar supporting the platform has one-third of its total length buried below ground, approximately how deep did the builders dig the hole for the pillar?



$\sin 3.75° = \frac{x}{550}$

$x = 550 \sin 3.75$

$x = 35.9717208\ldots$

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

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

$y = 53.95758161$

HOLE $= y - x = 18'$