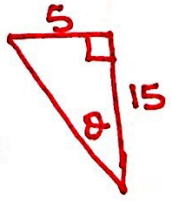
2015 Fall

1.) (A)

2.) graph, find intersection (A)

3.) range - y-values
graph it!

C.) $(-\infty, -5]$

4.) 

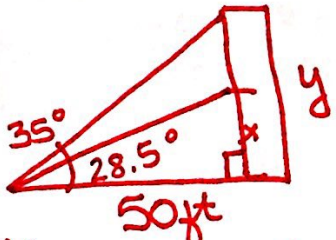
$\tan\frac{5}{15} = 18.4°$

(A)

5.) *change to exponential

(A) $3^2 = x-4$
$9 = x-4$
$13 = x$

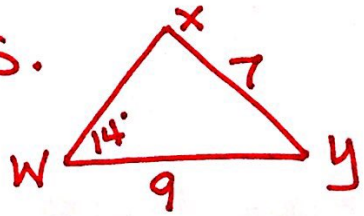
6.) (B)



$\tan 35° = y/50$ $\tan 28.5 = \frac{x}{50}$
$y = 35.01$ $x = 27.147$

$35.01 - 27.147 \approx \underline{7.863}$

7.) A.S.S.



(B)

$\frac{\sin 14}{7} = \frac{\sin x}{9}$

$x = 18.12°$

$180° - 18.12° \sim 161.8°$

$\frac{\sin 4.2}{a} = \frac{\sin 14}{7}$

$a = 2.02$

8.) (B) 

$f(x) = 3\sin(2x) + 4$

$g(x) = 3\sin(2x - \pi/2) + 4$

$2x = \pi/2$
$\boxed{x = \pi/4}$

9.) (A) decrease by 25%

* Compare regressions

10.) $g(x) = x^3 - 2$

$x = y^3 - 2$

$x + 2 = y^3$

(A) $\sqrt[3]{x+2} = y^{-1}$

11.) $r^2 = (-2\sqrt{3})^2 + (2\sqrt{3})^2$

$12 + 12$

$r = \sqrt{24} = 2\sqrt{6}$

$\tan\theta = \frac{2\sqrt{3}}{-2\sqrt{3}} = -45°$

(B)

12.) $r = \frac{2}{1+\cos\theta}$

$r + r\cos\theta = 2$

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

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

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

(C) $y^2 + 4x - 4 = 0$

parabola

$4x = -y^2 + 4$

$x = -\frac{1}{4}y^2 + 1$

13.) $x = \frac{1}{3}\sqrt{t} + 3$ $\quad y = 4t^2 - 7$

$3(x-3) = \sqrt{t}$ $\quad \frac{y+7}{4} = t^2$

$9(x-3)^2 = t$

$\frac{y+7}{4} = (9(x-3)^2)^2$

$\frac{y+7}{4} = 81(x-3)^4$

(D) $y = 324(x-3)^4 - 7$

14.) $a_n = 2a_{n-1} + 3, \; a_1 = 3$

$a_2 = 2(3)+3 = 9$

$a_3 = 2(9)+3 = 21$

Plug in #'s

(a.) $f(n) = 3(2^n - 1) = 3$ works

$f(2) = 3(2^2-1) = 9$ works

$f(3) = 3(2^3-1) = 21$ works

b.) ~~X~~ c) ~~X~~ d) ~~X~~

15) Geometric $S = \frac{25000}{1-.8} = 125{,}000$

(A)

16) graph

(B)

17) factor $\begin{cases} \frac{(x+k)(x-k)}{x-k} = x+k & x \neq k \\ 4-k & x = k \end{cases}$

$K+K = 2K$

(B)

18) Substitute in 3

(B)

19.) law of cos

$10^2 = 5^2 + 6^2 - 2 \cdot 5 \cdot 6 \cos x$

(D) $130.5°$

20.) $58.3 = \ln(1+x) + 52.4$

$5.9 = \ln(1+x$

$e^{5.9} = 1 + x$

$e^{5.9} - 1 = x$

(A) ~360

21.) $r = 2/5$ $\quad S = \frac{1}{1-2/5} = 5/3$

(C)

22.) $\frac{x-3}{5} = \cos t$ $\quad \frac{y+1}{5} = \sin t$

$\frac{(x-3)^2}{25} + \frac{(y+1)^2}{25} = 1$

$(x-3)^2 + (y+1)^2 = 25$

(C)

23.) $(6, 4\pi/3)$ QIII rad. Mode

$x = 6\cos(4\pi/3)$

$y = 6\sin(4\pi/3)$

$(-3, -5.196)$

(C)