BLC190-ATF NAME_____

# PRACTICE FINAL TEST

Which is **not** an answer to the equation. Put the answer in the box with the problem's number.

| | | | |
|---|---|---|---|
| 1. A | $e^0 =$ | c) 1 | d) $\pi/\pi$ |
| | | a) 0 | b) $\pi^{1-1}$ |

| | | | |
|---|---|---|---|
| 2. L | $\frac{\pi}{180} rad =$ | l) 45° | m) $\frac{circumference}{radius \cdot 180}$ |
| | | n) 1° | o) $\approx 0.175\, rad$ |

| | | | |
|---|---|---|---|
| 3. G | $\log_5 25 + \log_3 27 =$ | g) $\log_2 64$ | h) $(\sqrt{5})^2$ |
| | | i) $\approx e^{1.609}$ | j) 5 |

| | | | |
|---|---|---|---|
| 4. O | $\log_\pi 1 =$ | o) $\pi^0$ | p) $\pi(\pi^{-1}) - e(e)^{-1}$ |
| | | q) $\frac{0}{\pi}$ | r) 0 |

| | | | |
|---|---|---|---|
| 5. R | $2\log_2 2 =$ | a) $\sqrt{4}$ | e) 2 |
| | | r) $\log_2 2^4$ | s) $\log_8 64$ |

| | | | |
|---|---|---|---|
| 6. I | $9^{1.5} =$ | a) $9^{1/3}$ | i) $9^{1/2}$ |
| | | e) 27 | m) $3^3$ |

Solve for x. Put letter answer for *x* in box to left.

| | | | |
|---|---|---|---|
| 7. S | $x^{2/e} + x^{1/e} = 56$ (2 answers required) | o) $-7^e$ | s) $-8^e$ |
| 8. M | | m) $7^e$ | n) $8^e$ |

Hint: Arithmetic using Hindu-Arabic numerals.

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9. Find all solutions for *x*: $x^9 - 256x = 0$ x = 0, ±2

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10. Find all solutions to this system of equations:

$x + y = 4$ *and* $x^2 + y = 16$

*(x, y) = (-3, 7) or (4, 0)*

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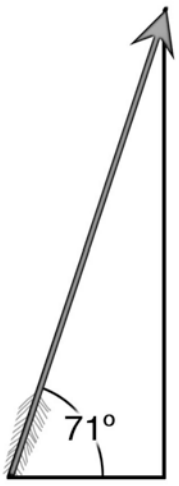
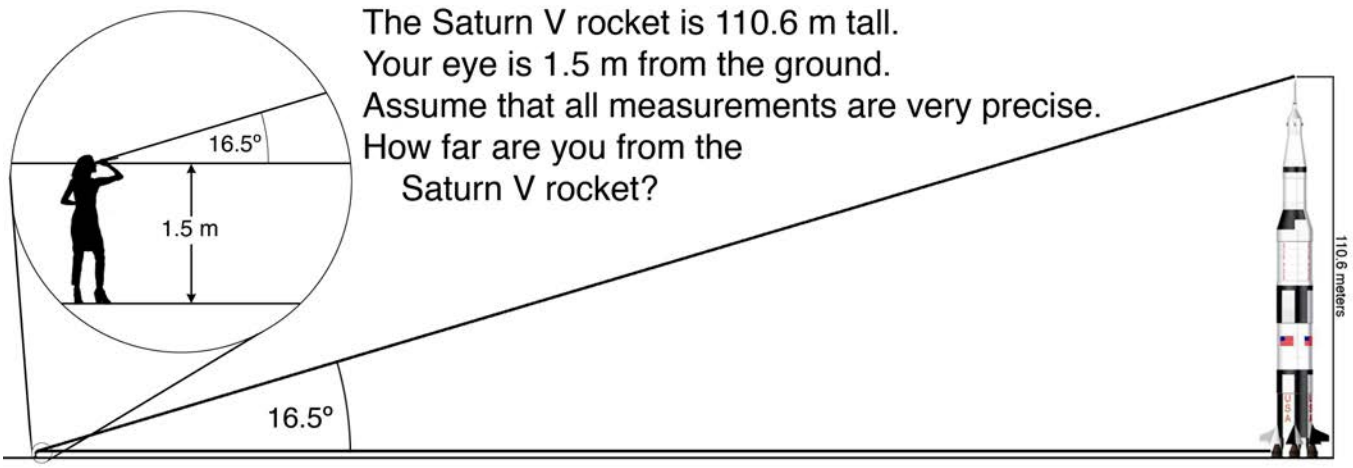
11. Odysseus shoots an arrow from his incredibly mighty bow. What are the vertical and horizontal components of a *250 ft/s* velocity directed 71° upward as shown in the diagram.




$v_y \cong 236.38$ ft/s

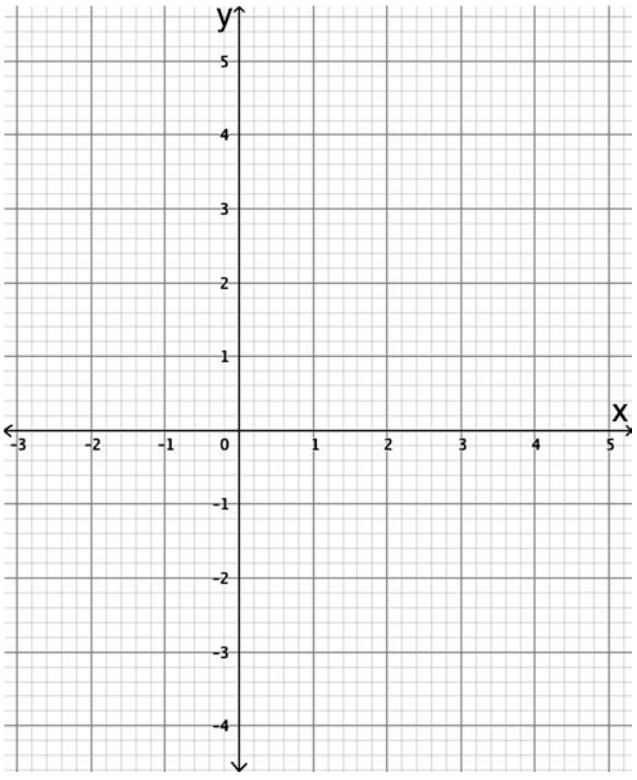
$v_x \cong 81.39$ ft/s

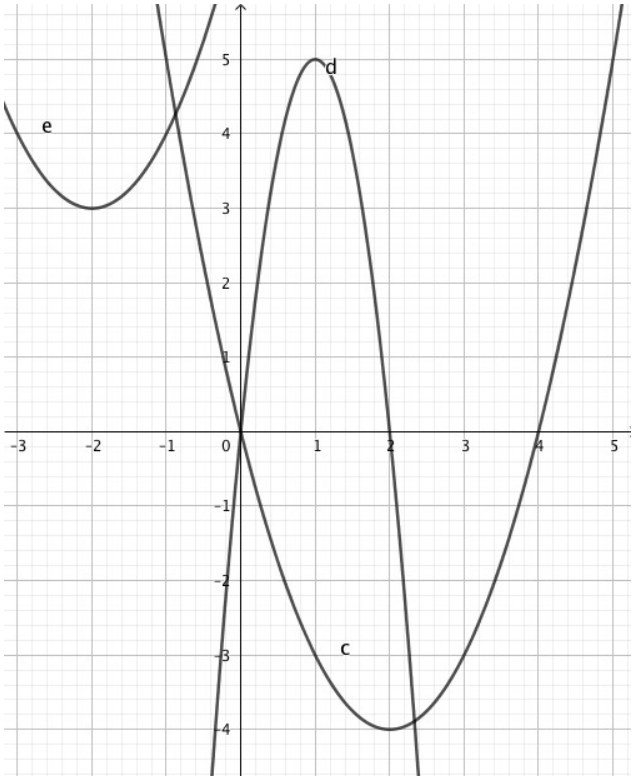
12. about 368.351 m




Find the $x_{intercepts}$ (where y = 0), the $y_{intercepts}$ (where x = 0), and the vertices of the following quadratic equations. Then graph all three on the provided graph (and label which is which).

| | | x-intercepts | y-intercepts | vertex |
|---|---|---|---|---|
| 13. | $y = (x + 2)^2 + 3$ | none | *(0, 7)* | *(-2, 3)* |
| 14. | $y = x^2 - 4x$ | *(0, 0) & (4 ,0)* | *(0, 0)* | *(2, -4)* |
| 15. | $y = -5x^2 + 10x$ | *(0, 0) & (2, 0)* | *(0, 0)* | *(1, 5)* |



**16. Population Growth or Decline**

The population growth rate today is 1.09%. In 2000 it was 1.29%. Assuming a linear decrease in this rate (a crude approximation), when will population growth be 0%?

Pop. growth will be zero ca. 2116. $y(x) = -0.0001111x + 0.23512222$

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17. Take your time and graph this linear equation for maximum comprehension... What I mean by that is... make it suitable for publication in a newspaper. Adjust the scales on the axes so that the slope is apparent, so that the years are relevent, and so that you can easily see the growth rate hit zero. Make it a work of graphic art.

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18. The world population is approximately 7.66 billion right now. Assuming an average annual growth rate of 0.645% (0.00645) for the next 100 years, what will be the population in 2118? [Use the compound interest formula and compound it annually ($n = 1$).]

Compound Interest → $A(t) = P\left(1 + \frac{r}{n}\right)^{nt}$

$$A(t) = 7.66\left(1 + \frac{0.00645}{1}\right)^{100} = 14.57 \; billion \; people$$

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19. Carbon-14 Dating. You are given some charcoal from the Chauvet Cave in France. It's $^{14}C$ is measured at 1.2%.

$t \cong 36{,}552 \; years \; old$

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20.

| | |
|---|---|
| a) $\theta = 108°$ | f) If the radius of the circle of 5, what is the total length of the perimeter of this pentagon? |
| b) $\varphi = 54°$ | 29.389... |
| c) $\gamma = 72°$ | |
| d) $\lambda = 36°$ | |
| e) $\omega = 54°$ | |