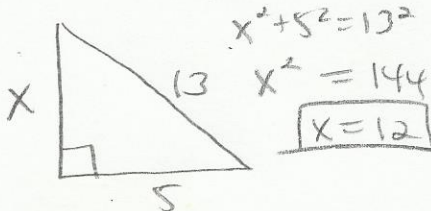


Review of Practice Math Placement Test

Multiple Choice: Identify the choice that best completes the statement or answers the question.

- A 1. A 13 foot wire stretches from the top of a pole to a point on the ground 5 feet from the base of the pole. If the ground is level and forms a right angle with the pole, what is the height, in feet, of the pole?

- A. 12
B. 30
C. 8
D. 18
E. 16



- B 2. Which of the following is an equivalent form of $\frac{4}{x} + \frac{3}{y}$?

- A. $\frac{4x+3y}{xy}$
B. $\frac{4y+3x}{xy}$
C. $\frac{3x+4y}{xy}$
D. $\frac{12}{xy}$
E. $\frac{7}{xy}$

$$= \frac{4y}{xy} + \frac{3x}{xy}$$

$$= \frac{4y+3x}{xy}$$

- E 3. Which of the following statement is true?

- A. $\frac{2}{3} = 0.667$ F $\rightarrow .\bar{6}$
B. $-53 > -7$ F $\rightarrow -53 < -7$
C. $\frac{6}{5} > \frac{21}{10}$ F $\rightarrow 1.2 < 2.1$
D. $4.5\% = 0.0045$ F $\rightarrow 4.5\% = .045$
E. $\frac{1}{3} = 0.\bar{3}$ T

- A 4. Simplify: $(3 + \sqrt{5})^2 = (3 + \sqrt{5})(3 + \sqrt{5})$

- A. $14 + 6\sqrt{5}$
B. 14
C. 30
D. $14 + 2\sqrt{5}$
E. $9 + 2\sqrt{5}$

$$= 9 + 3\sqrt{5} + 3\sqrt{5} + 5$$

$$= 14 + 6\sqrt{5}$$

- E 5. The quadratic equation $2x^2 - 3x = 20$ has two solutions. Find the large of the two solutions.

- A. $x = \frac{5}{2}$
B. $x = -\frac{5}{2}$
C. $x = -4$
D. $x = -\frac{1}{2}$
E. $x = 4$

$$2x^2 - 3x - 20 = 0$$

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

$$2x+5=0 \quad x-4=0$$

$$x = -\frac{5}{2} \quad x = 4$$

Small Large

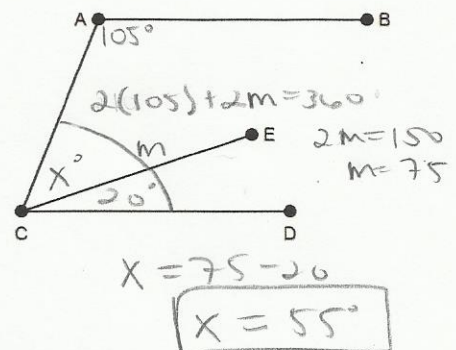
- E 6. If the graph of $y = x^2$ is translated 4 units to the left and 1 unit up in the standard coordinate system, then the translated graph has which of the following equations?

- A. $y = (x+4)^2 - 1$
B. $y = (x+1)^2 + 4$
C. $y = (x-4)^2 - 1$
D. $y = (x-4)^2 + 1$
E. $y = (x+4)^2 + 1$

$$y = (x+4)^2 + 1$$

(left 4) (up 1)

- A 7. In the figure, \overline{AB} is parallel to \overline{CD} , $m\angle BAC = 105^\circ$, $m\angle ECD = 20^\circ$, and $m\angle ACE = x^\circ$.

Find x° .

- A. 55°
B. 85°
C. 65°
D. 45°
E. 75°

8. The graphs of the lines $y = 4 - x$ and $x = 6$ intersect at a point. What is the y-coordinate of that point?

A. 3
B. -2
C. 0
D. 1
E. 5

$y = 4 - x$
 $y = 4 - 6$
 $y = -2$

9. When buying airline tickets on the web, there is an added fee of 1.15% on the price of each ticket purchased. If a ticket from Boston to Raleigh costs \$180, what is the additional fee of the nearest cent?

A. \$200.07
B. \$207.00
C. \$2.07
D. \$20.07
E. \$2.00

$180 \times .0115$
 $= 2.07$

10. Tammy bought s shirts at d dollars per shirt, and p pants at $2d - 1$ dollars per pair. Which of the following is equivalent to the total amount Tammy spend in dollars (before taxes)?

A. $sd + 2pd - p$
B. $sd + 2pd - 1$
C. $sd + p(2d - 1)$
D. $(s + p)(3d - 1)$
E. $s + 3d + p - 1$

$sd + p(2d - 1)$
 $= sd + 2pd - p$

11. The intervals of weights of a groups of elementary school children are recorded in the table below. What percent of the group is found in the mode?

WEIGHTS OF STUDENTS	
Weight in lbs.	Frequency
51 - 60	3
61 - 70	16
71 - 80	24
81 - 90	22
91 - 100	18
101 - 110	12
111 - 120	3
121 - 130	2
TOTAL	100

A. 28%
B. 13%
C. 14%
D. 12.5%
E. 24%

most often

$\frac{24}{100} = 24\%$

12. Which of the following is equal to $\left(\frac{1}{3}x^2\right)^{-2}$?

A. $\frac{9}{x^4}$
B. $9x^4$
C. $6x^4$
D. $\frac{6}{x^4}$
E. $\frac{1}{9x^4}$

$\frac{1^{-2}}{3^{-2}} \frac{x^{-4}}{1}$
 $= \frac{3^2}{1^2 x^4} = \frac{9}{x^4}$

13. Which equation represents a line that contains the points $(-2, -7)$ and $(4, 5)$?

A. $2x - y = 3$
B. $2x + y = 3$
C. $y = 2x + 3$
D. $y = 3x - 2$
E. $y = \frac{1}{2}x - 3$

$m = \frac{5 - (-7)}{4 - (-2)} = \frac{12}{6} = 2$
 $y - 5 = 2(x - 4)$
 $y - 5 = 2x - 8$
 $y = 2x - 3$

14. The greatest common factor of $8x^3y^2z^2 + 12x^2y^3z^2 - 4x^4yz^4$

A. $16x^5y^5z^3 - 4x^4yz^4$
B. $16xy^4z^{-1}$
C. $4x^4y^3z^4$
D. $4x^2yz$
E. $4x^2y$

$= 4x^2yz$

15. What kind of function would best model the data below, where x is the independent variable and y is the dependent variable?

x	-3	-2	-1	0	1	2	3
y	128	33.2	8.1	1.9	0.6	0.13	0.03

Closest to 1 or -1 look at scatter plot

A. exponential $r = -0.999665$
B. cubic $r = 0.9923504$
C. quadratic $r = 0.9430068$
D. linear $r = -0.74889296$
E. rational $r = N/A$

16. The domain of the function defined by the equation

$f(x) = \sqrt{x - 3}$ is

A. All real numbers.
B. $\{x \mid x < -3\}$
C. $\{x \mid x \geq 0\}$
D. $\{x \mid x \geq -3\}$
E. $\{x \mid x \geq 3\}$

$x - 3 \geq 0$
 $+3 +3$
 $x \geq 3$

17. Which expression below is an equivalent form of

$$\frac{8m^3 - 4m^2}{2m^2} \text{ (where } m \neq 0\text{)?}$$

- A. $4m^2 - 2m$
 B. $2m + 4$
 C. $4m - 2$
 D. $2m - 1$
 E. $4m - 1$

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

18. The area formula for a trapezoid is
- $A = \frac{1}{2}h(b_1 + b_2)$
- . If
- $A = 18$
- ,
- $h = 5$
- , and
- $b_2 = 2$
- , find
- b_1
- .

- A. $\frac{63}{2}$
 B. $\frac{36}{5}$
 C. $\frac{36}{7}$
 D. $\frac{26}{5}$
 E. 63

$$2 \cdot 18 = \frac{1}{2} \cdot 5 (b_1 + 2) \cdot 2$$

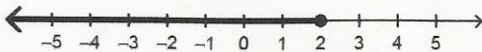
$$36 = 5(b_1 + 2)$$

$$36 = 5b_1 + 10$$

$$26 = 5b_1$$

$$b_1 = \frac{26}{5}$$

19. Given:



This is an illustration of the solution set for which inequality below?

- A. $4x < 2 \rightarrow x < \frac{1}{2}$
 B. $6x \geq 3 \rightarrow x \geq \frac{1}{2}$
 C. $-3x \geq -6 \rightarrow x \leq 2$
 D. $2x \geq -18 \rightarrow x \geq -9$
 E. $2x > 4 \rightarrow x > 2$

20. Simplify:
- $5(3 + 4x) - 6 + 7(x + 6)$

- A. $51x + 27$
 B. $21x - 21$
 C. $27x + 51$
 D. $21x + 21$
 E. $27x - 51$

$$15 + 20x - 6 + 7x + 42 = 27x + 51$$

21. If the ratio of boys to girls on a high school yearbook committee of 15 members is 3 to 2, how many members of the committee are girls?

- A. 9 $\frac{66}{99} = .66$ $\frac{36}{29} = 1.5$
 B. 12 $\frac{36}{108} = .25$
 C. More information needed.
 D. 6 $\frac{96}{63} = 1.5$
 E. 3 $\frac{96}{39} = 3$

22. If
- $9r - 2s = 45 - 3r$
- , what is
- s
- in terms of
- r
- ?

- A. $\frac{c}{2}$
 B. r
 C. $2r$
 D. $4r$
 E. $\frac{r}{4}$

$$9r - 2s = 45 - 3r$$

$$-9r \quad -45 \quad -45 \quad -9r$$

$$-6s = -12r$$

$$-6 \quad -6$$

$$s = 2r$$

23. A rectangular field is 45 feet wide and is enclosed by 166 feet of fencing. What is the area of the field in square feet?

- A. 1,710
 B. 1,722.25
 C. 1867.5
 D. 7,470
 E. 38

$$2x + 2(45) = 166$$

$$2x + 90 = 166$$

$$2x = 76$$

$$x = 38$$

$$A = 45 \cdot 38 = 1710$$

24. The endpoints of the diameter of a circle have coordinates
- $(2, -3)$
- and
- $(-4, 5)$
- . Find the length of the radius of the circle.

- A. 5π
 B. 10
 C. 5
 D. 4π
 E. 4

$$C = \left(\frac{2-4}{2}, \frac{-3+5}{2} \right)$$

$$= \left(-\frac{2}{2}, \frac{2}{2} \right) = (-1, 1)$$

$$r = \sqrt{(2-(-1))^2 + (-3-1)^2}$$

$$= \sqrt{9 + 16} = \sqrt{25} = 5$$

25. Find the solution of the equation
- $16^{3-6x} = 8$
- .

- A. $x = \frac{3}{8}$
 B. $x = -\frac{7}{4}$
 C. $x = \frac{5}{8}$
 D. $x = -\frac{1}{2}$
 E. $x = \frac{12}{5}$

$$(2^4)^{3-6x} = 2^3$$

$$4(3-6x) = 3$$

$$12 - 24x = 3$$

$$-24x = -9$$

$$-24 \quad -24$$

$$x = \frac{3}{8}$$

26. A rescue helicopter is hovering 144 feet above a sailboat in distress. The helicopter drops a life raft. The height in feet, h , of the raft above the water can be modeled by $h(t) = -16t^2 + 144$, where t is the time in seconds after it is dropped. How many seconds after the raft is dropped will it hit the water?

A. 2
 B. 3
 C. 9
 D. 3.5
 E. 2.5

$$\begin{aligned} -16t^2 + 144 &= 0 \\ -16t^2 &= -144 \\ t^2 &= 9 \\ t &= 3 \end{aligned}$$

27. Find the slope of a line with equation $5x - 3y - 6 = 0$.

A. $-\frac{5}{3}$
 B. $\frac{3}{5}$
 C. -2
 D. $-\frac{3}{5}$
 E. $\frac{5}{3}$

$$\begin{aligned} 5x - 3y &= 6 \\ -3y &= -5x + 6 \\ -3 &\quad -3 \quad -3 \\ y &= \left(\frac{5}{3}\right)x - 2 \end{aligned}$$

slope

28. The complex fraction $\frac{4 - \frac{3}{4}}{\frac{9}{4} - 1.75}$ is equivalent to

A. $\frac{2}{13}$
 B. None of these.
 C. $\frac{13}{2}$
 D. $\frac{13}{4}$
 E. $\frac{4}{13}$

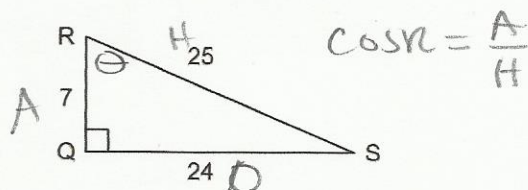
$$\begin{aligned} \frac{4 - \frac{3}{4}}{\frac{9}{4} - 1.75} &= \frac{4 - \frac{3}{4}}{\frac{9}{4} - \frac{7}{4}} \\ &= \frac{4 - \frac{3}{4}}{\frac{2}{4}} \\ &= \frac{16 - 3}{2} = \frac{13}{2} \end{aligned}$$

29. If an athlete's weight decreases from 180 pounds to 168 pounds, what is the percent decrease?

A. 6.7%
 B. 0.93%
 C. 7.1%
 D. 0.06%
 E. 6%

$$\begin{aligned} \frac{180 - 168}{180} &= \frac{12}{180} = 6.7\% \end{aligned}$$

30. In the given right triangle, $\triangle QRS$, find the value of $\cos R$.



A. $\frac{7}{24}$
 B. $\frac{25}{24}$
 C. $\frac{24}{25}$
 D. $\frac{7}{25}$
 E. $\frac{24}{7}$

$$\cos R = \frac{7}{25}$$

31. Simplify $(3 \times 10^{-3})^4$. Write the answer in scientific notation.

A. 81×10^{-12}
 B. 12×10^{-12}
 C. 3×10^{-1}
 D. 8.1×10^{-11}
 E. 30×10^{-7}

32. If $f(x) = |3x - 5|$, then find $f(-2)$.

A. -11
 B. 13
 C. 1
 D. 11
 E. -1

$$\begin{aligned} f(-2) &= |3(-2) - 5| \\ &= |-6 - 5| \\ &= |-11| \\ &= 11 \end{aligned}$$