1.) $w = \frac{l}{8}$

$h = 3w$

An engineer determined that a bridge he is designing has a maximum stability when its length, l, width, w, and height, h, are defined by the equations above. If he wants to build a bridge with a height of 9 meters, what should be the length of the bridge, in meters?

A) 48

B) 24

C) 12

D) 6

2.) $2x^2 - x = 15$

Which of the following is a correct value for x in the equation above?

A) 3

B) 2

C) -2

D) -4

3.) The formula $d = rt$ is used to calculate the distance an object travels over a period of time, t, at a constant rate, r. Based on this formula, what is the rate, r, in terms of d and t?

A) $r = \frac{d}{t}$

B) $r = dt$

C) $r = \frac{t}{d}$

D) $r = d - t$

4.) The sum of four consecutive integers is 190. What is the third integer?

A) 45

B) 46

C) 47

D) 48

5.) If $36 + 3(4x - 9) = c(2x + 1) + 25$ has no solution and c is a constant, what is the value of c?

A) -3

B) 3

C) 6

D) 12

6.) What value of y satisfies the equation below?

$$\frac{9}{4}(y - 8) = \frac{27}{2}$$

7.)

$$\frac{3(k - 1) + 5}{2} = \frac{17 - (8 + k)}{4}$$

In the equation above, what is the value of k?

A) $\frac{9}{13}$

B) $\frac{5}{7}$

C) $\frac{8}{7}$

D) $\frac{8}{5}$

8.) $\frac{1}{2}(4a + 10b) = b$

If (a, b) is a solution to the equation above, what is the ratio $\frac{b}{a}$, given that $a \neq 0$?

A) $-\frac{1}{3}$

B) $\frac{1}{3}$

C) $\frac{3}{2}$

D) 3

9.) Which is NOT a solution of $5x - 4 < 12$?

A) -2

B) 0

C) 3

D) 4

10.) Which are the solutions of $3(x - 4) \leq 18$ and $2(x - 1) \geq 6$?

I. 9 II. 12 III. 15

A) I only

B) I and III

C) II only

D) II and III

11.) Evaluate $\frac{4a^2}{2b-3}$ for $a = 3$ and $b = 6$.

A) 3

B) 4

C) 6

D) 16