Choose closet answer.

pred = predicted, frac = fraction, regr = regression, expl = explained by, etc.

1 - 10 $\bar{x} = 6$, $\bar{y} = 10$, $s_x = 5$, $s_y = 3$, $r = 0.8$, $n = 300$

1. slope of naive : a. 1.7 b. 1.8 c. 0.6 d. 1.2 e. 0.7
2. slope of regr : a. 1.7 b. 1.5 c. 1.9 d. 1.2 e. 0.6
3. frac s_y^2 expl by regr : a. 0.1 b. 0.2 c. 0.3 d. 0.5 e. 0.6
4. r[6 x + 2, 3 y - 4] : a. 0.5 b. 0.8 c. 0.6 d. 0.65 e. 0.7
5. pred y for x = 11 : a. 13 b. 13.5 c. 14 d. 14.5 e. 15
6. pred y for x = 16 : a. 13 b. 14 c. 15 d. 16 e. 17
7. est of μ_y if μ_x = 6 : a. 10 b. 9 c. 11 d. 12 e. 13
8. std dev of y at x = 14 : a. 3.6 b. 2.2 c. 2.9 d. 1.8
9. Is regr of y on x same as regr of x on y? a. no b. yes
10. Is r[x, y] = r[y, x]? a. no b. yes

11 - 12 (x, y) data is {(0, 2), (4, 4), (4, 10)}

11. Slope of regr : a. 1.0 b. 1.3 c. 1.6 d. 1.8 e. 2.0
12. y - intercept : a. 2 b. 2.4 c. 3 d. 3.7 e. 4.1

13 - 14 Data {2, 4, 7}

13. s for above data : a. 2.0 b. 1.3 c. 2.5 d. 2.9
14. $\hat{\sigma}$ for above data : a. 2.0 b. 1.3 c. 2.5 d. 2.9

1. $\frac{s_y}{s_x} = \frac{3}{5} = .6$
2. $r\frac{s_y}{s_x} = .8(.6) = .48$
3. $R^2 = r^2 = .8^2 = .64$
4. $r[6x+2, 3y-4] = r[x, y] = .8$
5. $\hat{y}_{11} = .48(11) + (10 - .48(6)) = 12.4$
6. $\hat{y}_{16} = .48(16) + (10 - .48(6)) = 14.8$
7. $(\bar{x}, \bar{y})$ Reg. passes thru $\Rightarrow$ Est of $\mu_y = \bar{y} = 10$
8. R^2 = frac s_y^2 explained by regr.
   $\Rightarrow 1 - R^2$ = frac. left unexplained for any x.
   $\Rightarrow (1-R^2)s_y^2 = (1-.64)(3)^2 = 3.24$ = Var of y at x = any point $\Rightarrow \sqrt{3.24} = 1.8$ answer

9. No, you will be minimizing the sums of squares in the horizontal direction instead of vertical
10. Yes, measures linear relationship (strength of) without regard to order.

11-12

X	Y	$(x-\bar{x})$	$(y-\bar{y})$	$(x-\bar{x})(y-\bar{y})$	$(x-\bar{x})^2$	$(y-\bar{y})^2$
0	2	$-8/3$	$-10/3$	$80/3^2$	$64/9$	$100/9$
4	4	$4/3$	$-4/3$	$-16/3^2$	$16/9$	$16/9$
4	10	$4/3$	$14/3$	$56/3^2$	$16/9$	$196/9$
				$40/3$	$96/9$	$312/9$

$\bar{x} = 8/3 \quad \bar{y} = 16/3$

$$s_x = \sqrt{\left(\tfrac{1}{2}\right)\left(\tfrac{96}{9}\right)} \approx 2.309$$

$$s_y = \sqrt{\left(\tfrac{1}{2}\right)\left(\tfrac{312}{9}\right)} \approx 4.1633$$

$$r = \frac{40/3}{(2)(2.309)(4.1633)} = .6935$$

$$\Rightarrow \text{slope} = b_1 = r\frac{s_y}{s_x} = .6935\left(\frac{4.1633}{2.309}\right) = 1.25 \approx 1.3$$

$$y\text{-int} = b_0 = \bar{y} - b_1\bar{x} = \frac{16}{3} - 1.25(8/3) = 2$$

13-14

X	$(x-\bar{x})$	$(x-\bar{x})^2$
2	$-7/3$	$49/9$
4	$-1/3$	$1/9$
7	$8/3$	$64/9$
$\bar{x} = 13/3$		$114/9$

$$\Rightarrow s_x = \sqrt{\left(\tfrac{1}{2}\right)\left(\tfrac{114}{9}\right)} \approx 2.52 \approx 2.5$$

$$\hat{\sigma}_x = \sqrt{\left(\tfrac{1}{3}\right)\left(\tfrac{114}{9}\right)} \approx 2.05 \approx 2.0$$