

## Fifth Form Review

To be done on A4 paper, not in your books.

1. Solve  $(x - 2)^2 - 100 = 0$ .

$x = 12$  or  $x = -8$

2. A bag has 6 blue and 3 red balls. I select two from the bag without replacement.

(a) Draw this situation in a tree diagram.

(b) Find the probability of at least one red.

$\frac{7}{12}$

3. Solve  $(x + 3)(x + 2) = 6$ .

$x = 0$  or  $x = -5$

4. Solve  $(x + 2)(x + 10) > 0$ .

$x > -2$  or  $x < -10$

5. Express  $0.\dot{2}8\dot{2}$  as a fraction in its lowest form.

$\frac{94}{333}$

6. Solve  $\cos x = 0.3$  in the range  $0^\circ < x < 720^\circ$ .

$x = 72.5$  or  $x = 287.5$  or  $x = 432.5$  or  $647.5$

7. Solve  $8^{x+1} = 4^x$ .

$x = -3$

8. Find the equation of the line through  $(-2, \frac{1}{3})$  perpendicular to the line  $x + 7y = 9$ . Give your answer in the form  $ax + by + c = 0$  where  $a$ ,  $b$  and  $c$  are integers.

$21x - 3y + 43 = 0$

9. Express  $\frac{1}{x-1} + \frac{3}{x+1}$  as a single fraction.

$\frac{4x-2}{x^2-1}$

10. Express  $0.7\dot{8}\dot{1}$  as a fraction in its lowest form.

$\frac{43}{55}$

11. Factorise  $16x^2 - 9x$ .

$x(16x - 9)$

12. Solve  $(2x + 3)(x + 4) \leq 0$ .

$-4 \leq x \leq -\frac{3}{2}$

13. A bag has 3 blue, 7 red balls and 5 yellow balls. I select two from the bag without replacement.

(a) Draw this situation in a tree diagram.

(b) Find the probability of one blue.

$\frac{12}{35}$

14. Find the equation of the line through  $(-4, 3)$  parallel to the line  $x - 3y = 7$ . Give your answer in the form  $ax + by + c = 0$  where  $a$ ,  $b$  and  $c$  are integers.

$x - 3y + 13 = 0$

15. A ship sails 10 km on a bearing of  $100^\circ$ . It then sails 5 km on a bearing of  $200^\circ$ . How far is it from its starting point? [Draw a sketch. Draw north lines.]

10.37km

16. In triangle  $ABC$ ,  $AB = 4$ ,  $BC = 9$  and  $\hat{ACB} = 50^\circ$ . Find  $\hat{BAC}$ .

Impossible

17. Express  $\frac{3}{x-1} - \frac{4}{(x-1)^2}$  as a single fraction.

$\frac{3x-7}{(x-1)^2}$

18. Solve  $(3x - 1)^2 - 9 = 0$ .

$x = \frac{4}{3}$  or  $x = -\frac{2}{3}$

19. Factorise  $25x^2 - 16$ .

$(5x + 4)(5x - 4)$

20. Solve  $3x^2 \geq 14 - x$ .

$x \geq 2$  or  $x \leq -\frac{7}{3}$

21. A ship sails 3 km on a bearing of  $300^\circ$ . It then sails 5km on a bearing of  $080^\circ$ . How far is it from its starting point? [Draw a sketch. Draw north lines.]

3.32km

22. Solve  $16^{2x-1} = 2^{x-1}$ .

$x = \frac{3}{7}$

23. Solve  $16 \sin^2 x = 4$  in the range  $-360^\circ < x < 360^\circ$ .

$x = \pm 30$  or  $x = \pm 150$  or  $x = \pm 210$  or  $x = \pm 330$

24. In triangle  $ABC$ ,  $AB = 9$ ,  $BC = 8$  and  $AC = 7$ . Find  $\hat{BAC}$ .

$58.4^\circ$