

## Fifth Holiday Work

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

1. Solve  $(x - 3)^2 - 64 = 0$ .
2. A bag has 5 blue and 7 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 blue.
3. Solve  $(x + 1)(x + 2) = 20$ .
4. Solve  $(x - 7)(x + 8) > 0$ .
5. Express  $0.\dot{3}4\dot{5}$  as a fraction in its lowest form.
6. Solve  $\cos x = 0.4$  in the range  $0 < x < 720$ .
7. Solve  $9^{x+1} = 27^x$ .
8. Find the equation of the line through  $(2, \frac{1}{2})$  perpendicular to the line  $x - 7y = 9$ . Give your answer in the form  $ax + by + c = 0$  where  $a$ ,  $b$  and  $c$  are integers.
9. Express  $\frac{1}{x+1} + \frac{3}{x}$  as a single fraction.
10. Express  $0.7\dot{8}$  as a fraction in its lowest form.
11. Factorise  $4x^2 - 9x$ .
12. Solve  $(2x - 1)(x - 3) \leq 0$ .
13. A bag has 8 blue, 3 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 at least one blue.
14. Find the equation of the line through  $(4, 3)$  parallel to the line  $2x + 3y = 9$ . Give your answer in the form  $ax + by + c = 0$  where  $a$ ,  $b$  and  $c$  are integers.
15. A ship sails 10 km on a bearing of  $100^\circ$ . It then sails 5 km on a bearing of  $030^\circ$ . How far is it from its starting point? [Draw a sketch. Draw north lines.]
16. In triangle ABC,  $AB = 8$ ,  $BC = 10$  and  $\widehat{ACB} = 50$ . Find  $\widehat{BAC}$ .
17. Solve  $\sin x = -0.8$  in the range  $-360 < x < 360$ .
18. Express  $\frac{2}{(x+1)^2} - \frac{4}{x+1}$  as a single fraction.
19. Solve  $(2x + 1)^2 - 100 = 0$ .
20. Factorise  $4x^2 - 9$ .
21. Express 0.78 as a fraction in its lowest form.
22. Solve  $x(x + 4) = 21$ .
23. Solve  $2x^2 \geq 3 - x$ .

24. A ship sails 2 km on a bearing of 200. It then sails 3km on a bearing of 080. How far is it from its starting point? [Draw a sketch. Draw north lines.]
25. Solve  $8^{2x-1} = 4^{x-1}$ .
26. Solve  $9 \sin^2 x = 4$  in the range  $-360 < x < 360$ .
27. A bag has 3 blue and 4 red balls. I select three from the bag without replacement.
- (a) Draw this situation in a tree diagram.
  - (b) Find the probability of at least two blues.
28. In triangle  $ABC$ ,  $AB = 8$ ,  $BC = 7$  and  $AC = 6$ . Find  $\widehat{BAC}$ .
29. Solve  $4(x + 1)(x + 2) = 3$ .
30. Solve  $(7x - 2)^2 - 1 = 0$ .
31. Express  $0.1\dot{3}\ddot{5}$  as a fraction in its lowest form.