MATH1050 Answers to Examples: Divisibility, Division Algorithm, rationals and irrationals.

1. ——

2. (a) $A = B = 1$.

   (b) ——

3. (a) $A = B = 1$.

   (b) ——

4. ——

5. (a) An appropriate choice of $P(n)$ is: '$(\sqrt{3}+1)^{2n+1} - (\sqrt{3}-1)^{2n+1}$ is an integer which is divisible by 2^{n+1}, and $(\sqrt{3}+1)^{2n+3} - (\sqrt{3}-1)^{2n+3}$ is an integer which is divisible by 2^{n+2}.'

   (b) An appropriate choice of $P(n)$ is: '$(3+\sqrt{5})^{n+1} + (3-\sqrt{5})^{n+1}$ is an integer which is divisible by 2^{n+1}, and $(3+\sqrt{5})^{n+2} + (3-\sqrt{5})^{n+2}$ is an integer which is divisible by 2^{n+2}.'

6. ——

7. ——

8. ——

9. ——

10. ——

11. ——

12. ——

13. ——

14. (a) ——

    (b) ——

    (c) i. ——

        ii. A. 4.   B. 4.

15. ——

16. (a) 7   (b) 1   (c) 36   (d) 18

17. ——

18. ——

19. ——

20. ——